California's Health Information Technology & Exchange Strategic Plan

August 2009

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Executive Summary

California is a beacon for technology innovation and health system transformation. Health providers in the State have long recognized the importance of health information technology (Health IT) and health information exchange (HIE) and the vital role it plays in establishing and maintaining a safe, efficient, high quality patient-centered health care system. Health IT & HIE have also figured prominently in the Governor's comprehensive health care reform efforts. This commitment was demonstrated in Governor Arnold Schwarzenegger's Executive Order S-12-06, issued in July 2006 and resulted in the California Health Information Technology Study. In March 2007, Governor Schwarzenegger issued Executive Order S-06-07 calling for the advancement of statewide health IT adoption to increase quality, strengthen transparency and promote accountability in the health care sector. The Order called for "100 percent electronic health data exchange" within ten years, and identified key actions for the state to pursue, including providing state leadership, leveraging state purchasing power and developing quality reporting mechanisms.

On February 17, 2009 President Obama signed into law the American Recovery and Reinvestment Act (ARRA). A portion of ARRA referred to as the Health Information Technology for Economic and Clinical Health Act (HITECH) authorizes approximately $36 billion in outlays nationally over six years for health information technology (Health IT). The vast majority of funds - $34 billion – are in the form of adoption incentives through entitlement programs for Medicaid and Medicare providers who demonstrate "meaningful use" of an EHR. The remaining $2 billion are appropriations in the form of grants, loans and demonstration programs.

In order to meet the promise of improved health care quality and efficiency intended by the Governor's Executive Order and realize the benefit of ARRA resources, the California Health and Human Services Agency (CHHS) is publishing this strategic plan to describe statewide activities necessary to achieve the implementation and meaningful use of electronic health records (EHRs) and health information exchange in the public and private sectors, leading California towards a patient and family centered health care delivery system.

The plan's purpose is: ***To dramatically improve safe and secure patient and provider access to personal health information and decision-making processes, benefiting the health and wellbeing, safety, efficiency, and quality of care for all Californians.***

The plan's purpose is supported by the following nine interlocking building blocks:

1. Health Information Exchange: To facilitate safe, secure electronic delivery and access of health information to the various stakeholders who need it to make informed decisions.
2. Regional Extension Centers: To assist in the implementation and meaningful use of EHRs for clinics, practices, hospitals and other health care institutions.
3. EHR Capital Loan Fund: to support the purchase of EHRs and enable their meaningful use.
4. Workforce Training & Development: To prepare the workforce for the upcoming acceleration of Health IT adoption.

5. Research & New Technology: To support the development and transfer of new technology and processes that facilitates meaningful EHR adoption and health information exchange.
6. Broadband & eHealth Expansion: To provide reliable, secure broadband networks, connecting providers, institutions and people to critical services.
7. Medicaid EHR Meaningful Use Incentive Program: To support meaningful EHR adoption and the effective administration of the State's incentive program for Medi-Cal providers and patients
8. Privacy & Security: To ensure safe, secure and efficient exchange and access of personal health information to authorized individuals and institutions
9. Public Health: To strengthen, integrate and align public health and health care service infrastructure.

Each section of the strategic plan recommends actions needed to achieve an advanced system of information exchange, a technical assistance network, funding for the purchase of technology, a health technology workforce, and infrastructure to support ongoing transfer of research to improve the quality of care and health outcomes for Californians.

Summary of Recommendations

Health Information Exchange
A robust, secure and sustainable Health Information Exchange (HIE) network is required to support meaningful EHR use priorities in the short term, and to improve health care quality, efficiency and reduce costs in the long term. CHHS convened a Health Information Exchange Advisory Board to guide the State's decision-making process and recommend HIE and health outcome priorities, including appropriate governance, technical, and sustainability models.

Health Information Exchange recommendations:

- HIE infrastructure should be developed and sustained in an environment that fosters trust. This requires an open, inclusive and transparent process that is respectful of divergent views and drives a process towards consensus.
- An HIE Governance Entity should be formed to build consensus across all stakeholders, align multiple health IT and HIE initiatives, establish roles and responsibilities among stakeholders and formally coordinates activities.
- The State must maintain an active leadership role in defining state priorities and coordinating activities across state agencies and non-state institutions.
- A sustainability model that allows all stakeholders to realize value from the exchange network must be developed. Engaging stakeholders, understanding their clinical and operational priorities and incorporating them into the exchange will help drive HIE towards the right model.
- A technology-agnostic technical architecture is needed that incorporates existing Health IT and HIE investments and allows for regional flexibility while maintaining statewide standards for exchange.
- Reporting requirements and performance measures are needed to ensure the safe and secure exchange of health information to realize the goal to improve health care quality and efficiency.

Regional Extension Centers (CAL-HITEC)
The adoption of complex technology, such as an electronic health record, is not a simple "plug-and-play" operation. To achieve meaningful use, providers need comprehensive technical assistance to facilitate readiness and planning, product selection and purchase, training, implementation and practice redesign.

CAL-HITEC Regional Extension Center recommendations:
- Develop a governance structure for Cal-HITEC (California's technical assistance centers) to include a statewide administrative body and a network of local extension centers. The administrative body should be a consortium of organizations that will oversee technical assistance services through Local Entities (LE), negotiate EHR and other group purchasing contracts, and support the development of a workforce to assist with technology adoption.
- Prioritize services to safety net providers, critical access, rural and public hospitals, and small practice physician groups to ensure meaningful use by providing on-site, off-site and on-line technical assistance.
- Become sustainable within two years through start-up federal funds, user fees, Medicaid incentive fees, grants and EHR Loan Fund payments.
- Develop performance measures to ensure that providers successfully meet meaningful use requirements within two years.

Electronic Health Record Working Capital and Loan Fund
ARRA will provide grant funding to some Federally Qualified Health Centers to procure EHR systems, and incentive payments to qualifying Medicaid and Medicare providers who demonstrate meaningful use of Electronic Health Records. To demonstrate meaningful use, providers must first purchase and install EHRs, redesign workflow and report measures qualifying them for incentive payments.

Electronic Health Record Working Capital and Loan Fund recommendations:
- Develop solutions to provide loans to non-profit safety net providers through California Health Facilities Financing Authority (CHFFA).
- Create a separate Regional Extension Center Working Capital Program for small private practice physicians and non-FQHC community clinics.

Workforce
ARRA will create unprecedented growth in demand for EHRs in a short period of time. Meeting this demand is not as simple as producing and selling more EHRs. Selecting, buying, installing, customizing, integrating, training, redesigning workflow and maintaining electronic health records requires considerable expertise. The existing health IT workforce cannot currently meet this dramatic increase in demand. At least 9,000 additional, skilled Health IT workers will be required to support widespread meaningful EHR adoption use.

Workforce recommendations:
- Build or identify a coalition to collaborate with relevant labor agencies, including Workforce Investment Boards (WIBs), Regional Health Occupational Resource Centers (RHORCs), academic institutions, employers, health care institutions and regional extension centers.
- Integrate health IT core competencies into training for all clinicians.
- Build the health IT workforce through "crossover" training programs.
- Update and standardize curriculum development to align with evolving needs of health IT.
- Collaborate with Cal-HITEC on the recruitment, training and placement of workers including "on-the-job workforce.
- Develop Health informatics leaders through clinical and applied health informatics at Certificate, Masters, and PhD levels.

Research & New Technology
The rapid development and evolution of health information technology and the exchange of health care information among health care institutions holds great promise in improving the way health services are delivered.   Innovative approaches to health care information enterprise integration (HIEI) through research and its application to and integration with health care delivery system will support innovation.

Research and New Technology recommendations:
- Establish a public-private Consortium of research centers to generate innovative approaches to health care information enterprise integration (HIEI) that builds on existing research infrastructure.
- Research goals should focus on high quality, cost effective care, focus on real-world impact and endeavor to rapidly integrate effective tools and processes into the health care delivery system.
- Develop Consortium services to include Research Matchmaking; Meta-analysis of Research, Research Workshops, Portal and Wiki for disseminating the Consortium and other research findings.

Broadband & eHealth
A ubiquitous broadband network is needed to support a sustainable Health IT and HIE infrastructure. Services including health information exchange, hosted EHR services, home health and telehealth services and others could be delivered effectively and safely over a dedicated network.

Broadband recommendations:
- eHealth services should be available across the broad spectrum of health care providers and patients to include patient monitoring services, provider and patient education, outpatient, inpatient, and disaster / emergency services.
- eHealth services must ensure secure, HIPAA compliant delivery of health information.
- A dedicated, interoperable eHealth network must provide inexpensive access for providers and consumers.
- The network should leverage CTN, CENIC and other resources, including Cal-HITEC.
- Priority targets for eHealth infrastructure should include rural and urban safety net providers, hospitals, emergency rooms, emergency response, public health departments, long term care facilities, hospice and home health, laboratories, pharmacies and specialty care providers.

Medi-Cal Meaningful Use
The Department of Health Care Services (DHCS) administers publicly financed health insurance and safety net programs to almost seven million people – one in every six Californians – through Medi-Cal and other programs. Medi-Cal is responsible for establishing a Medicaid meaningful use incentive program for California providers and can leverage the infrastructure described in this plan.

Medi-Cal Meaningful Use recommendations:
- Engage in a visioning and planning process to support the implementation of Federal Medicaid EHR meaningful use incentive program.
- Implement the plan and work in collaboration with the regional extension centers, health information exchange governance entity and working capital loan fund.
- Work with stakeholders to further define State–specific meaningful use criteria that aligns with the goals of the Medi-Cal program, its providers and the State strategic plan.

Privacy and Security

A comprehensive privacy and security framework is needed to support health information exchange that improves safe and secure patient and provider access to health information. The California Privacy and Security Advisory Board, a public-private collaborative of health care industry stakeholders, develops privacy and security policy recommendations for the Health and Human Services Agency.

Privacy and Security recommendations:
- CalPSAB should develop statewide policy and operational guidelines to support consistent, safe and secure health information exchange practices that adhere to State and Federal law.
- Cal-PSAB should harmonize State and Federal privacy and security laws and regulations to promote the exchange of individual health information within and outside of California.
- Cal-PSAB should work closely with the governance entities for HIE, Cal-HITEC and other new institutions to guide statutes and regulations for all health care stakeholders involved in the electronic exchange of health information.

Public Health
Health IT and HIE can support public health goals by monitoring population health outcomes, increasing outreach for and identifying priority prevention services, and supporting bio-surveillance and emergency response services. The California Department of Public Health, local health departments and health officers should work closely with the HIE Governance Entity, Regional Extension Centers, workforce and broadband eHealth efforts to identify priority areas to support these goals.

Public Health recommendations:
- Ensure state and regional registries are interoperable with each other
- Establish interoperability criteria and develop bi-directional interface capabilities with health information exchanges and electronic health record systems in practices, clinics, hospitals and long-term care facilities.
- Work with Medi-Cal to ensure public health priorities are incorporated into Medi-Cal meaningful use criteria.

Introduction

California is home to almost 37 million people, over 7 million of whom are uninsured. Our residents are served by a complex, fragmented market consisting of 400 hospitals, 180 community clinic corporations, over 1,200 nursing homes and 60,000 active physicians; two-thirds of whom provide services in private practices with ten or fewer physicians. The vast majority of these institutions use a paper-based system of record keeping:

- 13% of hospitals have fully implemented an electronic health record (EHR) system
- One-quarter of physicians in private practice have an EHR
- Five percent of community clinics are using an EHR

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> *Health information technology offers great promise as one means of enabling a goal of affordable, safe and accessible healthcare in California.*
>
> -Governor Arnold Schwarzenegger

efficiency and quality, or reduce costs. Health IT is a collection of tools like any other; their value is determined by their effective – or meaningful – use. **Health IT is instrumental in supporting the transformation of our healthcare delivery system** by improving patient and provider access to information and improving decision making processes. Health care spending today accounts for one-sixth of our gross domestic product - twice as much as other industrialized countries - with health outcomes that by many measures trail these same countries. It is with this perspective that this strategic plan lays out a vision for the creation of Health IT infrastructure to support health care transformation in California. This infrastructure is based upon nine fundamental interlocking building blocks:

1. Health Information Exchange: To facilitate safe, secure electronic delivery and access of health information to the various stakeholders who need it to make informed decisions.
2. Regional Extension Centers: To assist in the implementation and meaningful use of EHRs for clinics, practices, hospitals and other health care institutions.
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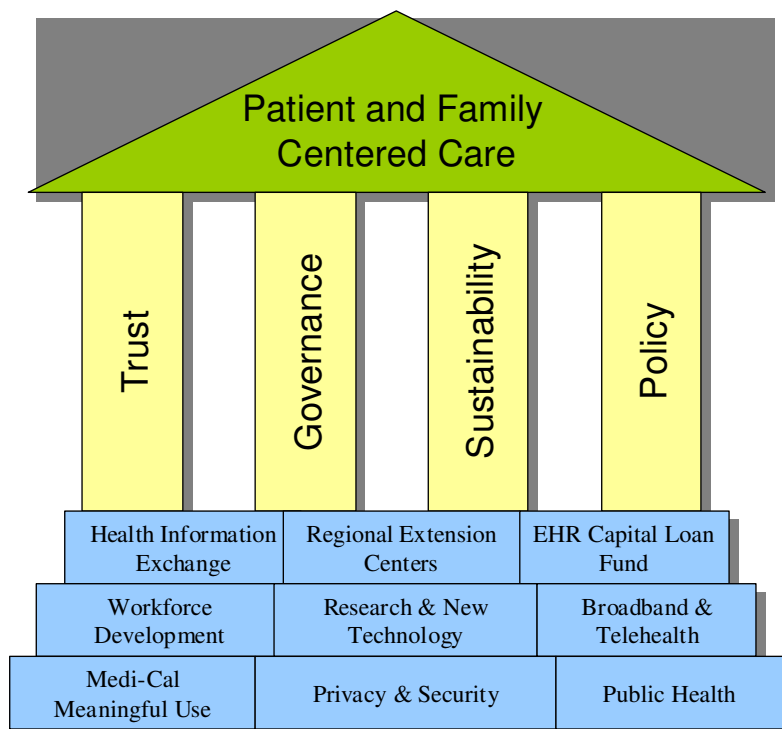
These building blocks will provide a critical foundation to support a health transformation agenda that ensures access to high-quality, low cost, patient-centered health care services. This foundation supports four enabling pillars:

- Trust: To create an environment that supports safe, secure, efficient data exchange, improving patient and provider access to vital information.
- Governance: To coordinate, oversee and be accountable to the public and ensure that the building blocks are not created and operated in isolation.
- Sustainability: To ensure the infrastructure is supportable and sustainable and adds value to all stakeholders.
- Policy: To ensure that the levers of law and regulation are integrated into the planning and implementation process, providing relief where needed and enforcement and oversight to protect the public interest where warranted.

This infrastructure supports a patient and family-centered care paradigm: where providers and patients together are empowered with information to make the best informed decisions; where providers, policy makers and purchasers are better able to understand effective (and ineffective) treatment pathways and disseminate that information quickly and effectively; and where providers can use information to demonstrate and be fairly and adequately reimbursed for the value of services they provide.

Accordingly, CHHS is publishing this strategic plan ("the Plan") to describe statewide activities necessary to achieve the implementation and meaningful use of electronic health records and health information exchange in the public and private sectors, leading California towards a patient and family centered health care delivery system.

Patient and Family Centered Care

Pillars: Trust | Governance | Sustainability | Policy

Health Information Exchange | Regional Extension Centers | EHR Capital Loan Fund
Workforce Development | Research & New Technology | Broadband & Telehealth
Medi-Cal Meaningful Use | Privacy & Security | Public Health

The Plan's purpose is: *To dramatically improve safe and secure patient and provider access to personal health information and decision-making processes, benefiting the health and wellbeing, safety, efficiency, and quality of care for all Californians.* The Plan's purpose is supported by the following seven objectives:

- To ensure patients have safe and secure access to their personal health information and the ability to share that information with others involved in their care.
- To engage in an open, inclusive, collaborative, public-private process that supports widespread EHR adoption and a robust, sustainable statewide health information exchange.
- To improve health care outcomes and reduce costs.
- To maximize California stakeholders' access to critical ARRA stimulus funds.
- To integrate and synchronize the planning and implementation of HIE, Health IT, telehealth and provider incentive program components of the federal stimulus act.
- To ensure accountability in the expenditure of public funds.
- To improve public and population health through stronger public health program integration, bio-surveillance and emergency response capabilities.

People support what they create; individuals and organizations are best positioned to define their needs, contribute and participate in a planning process that is open, inclusive, fair, and respectful of divergent and sometimes opposing views. This plan was developed in an open, public forum, with over 600 individuals participating over three months. Through this process, charters were developed, needs and priorities of California constituents and related opportunities under HITECH were articulated, and individual plans were drafted describing objectives and activities required to create the necessary building blocks. The process culminated in a summit attended by almost 200 people to finalize the individual plans and to define and address the interdependencies between each component.

The process was guided by the California Health Information Exchange Advisory Board (HIE-AB), a public-private board (see Appendix A) charged with informing and guiding the State's decision making processes. The board has guided the State's decisions primarily on health information exchange activities. Recommendations from the board were discussed in three town halls attended by over 200 people in Oakland, Los Angeles and Fresno, with feedback incorporated into subsequent recommendations included in this plan. An online survey collected over 135 responses and reported back findings. A website (www.hie.ca.gov) with a public workspace wiki was created to manage the flow and collation of information. Bi-weekly bulletins are published and discussed on monthly public stakeholder calls regularly attended by over 150 people. This plan is a result of these undertakings and could not have been done without the dedicated efforts of hundreds of volunteers, the summer intern-consultants, the staff at CalOHII and the Secretary of the California Health & Human Services Agency.

1   Health Information Exchange

1.1   Overview

The American Recovery and Reinvestment Act ("ARRA") provides a tremendous opportunity to rapidly accelerate implementation of Health IT and advance HIE in the state. The Act commits billion in grants, loans, and incentives to encourage meaningful use of Health IT in a secure, patient-centric

environment. The Governor appointed a Deputy Secretary of Health IT within CHHS, and the CHHS Secretary convened an HIE Advisory Board to provide guidance in the development of this plan.

Central to the long-term restructuring of the health care delivery system is the active engagement of patients. Physician dedication to patient engagement is critical in this regard. However, a HIE Governance Entity has an important role to play as it considers standards, policies, and guidance. The HIE Governance Entity must ensure that standards, policies and guidance supports the use of Personal Health Records and safe, secure, patient and provider access to these records.

This Strategic Plan represents a balance of the requirements of the State with the requirements outlined by the Office of the National Coordinator in its "State Health Information Exchange Cooperative Agreement Program". Importantly, the Strategic Plan sets forth a set of immediate actions including:

- Develop statewide HIE that is guided by health outcome goals that include individual and population health status elevation and governed by and implemented cooperatively by the public and private sectors.
- Develop and enforce policy requiring all statewide HIE participants to comply with a common set of privacy and security guidelines and policies.
- Develop and enforce vendor agnostic statewide technical guidance requiring all statewide HIE participants to comply with a common set of protocols and standards.
- Develop an approach for sustainability financing that does not rely on federal, state, or private grant-based funds.
- Coordinate an integrated approach with Medi-Cal and State public health programs to enable information exchange and support provider participation in HIE as required for Medicaid meaningful use incentives.
- Select an HIE Governance Entity that: 1) is a not-for-profit organization under California Law, 2) has a diverse board that accommodates broad stakeholder representation and State leadership, 3) engenders trust and collaboration between and among all stakeholders, 4) Inserts itself into operations only when requested by and driven from stakeholders, and 5) Uses robust administrative and financial processes to support transparency and accountability.

California must align its health information exchange implementation and priorities with the current federal definition of meaningful use to ensure that its eligible providers are positioned to receive the maximum incentive reimbursement and avoid future reimbursement penalties. The following immediate priorities are delineated to support Medicare and Medi-Cal providers:
- Electronic eligibility and claims transactions
- Electronic clinical laboratory ordering and results delivery
- Electronic prescribing and refill requests
- Electronic public health reporting
- Quality reporting
- Prescription fill status and/or medication fill history
- Clinical summary exchange for care coordination and patient engagement

The Strategic Plan will be implemented through the California HIE Operational Plan that will outline a comprehensive set of activities to achieve statewide HIE. The California HIE Operational Plan, currently being created, will be completed in December 2009.

1.2 HIE Readiness & Extent of HIE Adoption

California's current HIE efforts fall broadly into two categories: 1) large health systems, affiliated providers and ancillary services implementing integrated EHRs, and 2) community-driven efforts that aim to ensure ubiquitous availability of data within a region or across the State. Multiple independent initiatives have emerged over the past 15 years to address largely regional based demand for Health IT and HIE.

Community HIE Efforts: California's HIE activity is characterized by a wide range of local initiatives that have remained largely independent, nonprofit and grant funded. There are over 20 self-characterized HIEs throughout the state historically motivated by the health care needs of their local communities. While community HIE efforts often share a common mission to improve health care in their communities through HIE and Health IT, the efforts do not all share a common technical approach and are in various stages of development. Some efforts are foundational, organizing stakeholders and developing an approach to HIE; others are pre-implementation, selecting vendor partners and obtaining the necessary agreements among participants to enable HIE; others are mid-implementation, pilot testing the exchange of limited administrative data among a small number of users; and only a few are operational and exchanging clinical data. Three efforts exchanging clinical data are: Eastern Kern County Information Technology Association (EKCITA), Redwood MedNet and Santa Cruz HIE. The majority of community HIE efforts are pursuing some variation of a federated technology model and are working to be compliant with anticipated federal standards to enable interoperability. The pursuit of ongoing funding and development of a sustainable business model is a priority of community HIEs that are operating or planning operations today.

HIE Community Efforts

HIE	Year	Region	Org. Type	Technology	Operational*	NHIN	Clinical Priorities	Current Financing	Sustainability Model
Access El Dorado (ACCEL)	2004	El Dorado County	Un-Incorp-orated	Federated	NA	NA	Care coordination, public health	Grant	In development
CalRHIO	2006	Statewide	501(c)3 (2009)	Regional overlays; HIE backbone	NA	NA	Emergency Dept (ED)	Grant, Loan	Shared savings
EKCITA	2004	Eastern Kern County	501(c)3 (2009)	Hybrid open source system	3 clinics; 2 private practices; 1 hospital	NA	Diabetes & Regional public health issues	Grant	Minimum volume of users
Health-e-LA	2004	Los Angeles County	Un-Incorporated	Federated	NA	NA	Safety net	Grant, private	In development
Long Beach Network for Health	2003	Long Beach	501(c)3 (2007)	Hybrid federated model	NA	Yes	ED & Patient safety	Grant	Minimum volume of users
OCPRHIO	2007	Orange County	Un-Incorp-orated	Federated	NA	NA	Emergency Dept (ED)	Grant	In development
Redwood MedNet	2003	Mendocino & Lake Counties	501(c)3 (2005)	Federated with decentralized network	24 providers 5k transactions/ month	Yes	Clinical data, Lab results delivery	Grant	Minimum volume of users
Santa Cruz HIE	1995	Santa Cruz	IPA & hospital based	Push model; vendor outsourced	Local hospital, county clinics, IPA 90k trans-actions/mo	Yes	Clinical messaging, results delivery, eRx	IPA support	Hospital & IPA contributions

CalRHIO: The California Regional Health Information Organization (CalRHIO), founded in 2006, is a collaborative effort to improve health care safety and efficiency in California. The CalRHIO Board of Directors includes representatives from California's hospitals, medical groups, consumers, privacy advocates, local and state government agencies, health plans, safety net providers, and regional health information efforts. CalRHIO is currently engaged in a pilot with the Orange County Partnership Regional Health Information Organization (OCPRHIO) to aggregate data from CalOptima, a Medi-Cal provider, and 23 Emergency Departments. As part of the pilot, CalRHIO plans to provide various technical services including an MPI, RLS and patient consent. The pilot is scheduled to go-live in September 2009.

California Telehealth Network: The California Telehealth Network (CTN) was created in response to the Federal Communication Commission's (FCC) Rural Health Care Pilot Program and awarded $22.1 million in 2007 to increase access to acute, primary and preventive health care in rural areas. Significant investment of additional capital has been made by other partners. The CTN aims to create a statewide broadband network dedicated to health care, connecting public and non-profit health care providers in rural and urban locations.[1]

Integrated Health Systems: Several of California's integrated health systems currently exchange data between and among their affiliated physicians and hospitals. The systems have multiple locations and facilities throughout California and into neighboring states. While technical approaches and vendors vary, all of the health systems follow national standards and many participate in technical workgroups at the state and national levels. Health systems largely operate as closed networks and their information will largely remain proprietary and locked within those networks unless addressed through statewide collaboration.

1.3   Governance

A coordinated approach to health information exchange is required to meet California's vision and goals for HIE, to take advantage of significant federal investment in Health IT, and to create an infrastructure that allows California's providers to meet the goals of meaningful use which includes the ability to exchange health information.

Although there is a lack of consensus with respect to how to best pursue information exchange, there is agreement on a number of fundamental principles, including:
- The value of health information exchange, especially with respect to the upcoming meaningful use incentive program.
- A state-wide approach with respect to privacy and security.
- A technical architecture that uses standards-based protocols for interoperability based on federal standards and the NHIN implementation platform.
- An approach to leverage existing HIE and Health IT investments.
- An approach that allows for some level of regional variation to accommodate California's size and diverse regional needs and priorities.
- A process that supports rural areas and the safety-net.

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[1] The California Telehealth Network. Frequently Asked Questions. http://www.caltelehealth.org/ Accessed on 08/20/2009.

In order to meet the goals of HIE, governance in California should be implemented through a statewide HIE Governance Entity that is inclusive, fair, transparent and lead by a multi-stakeholder and diverse governing board. The HIE Governance Entity will establish the roles, responsibilities, and relationships between parties to organize, promulgate and oversee activities among stakeholders and across State, regional, and local levels and implementation of associated accountability mechanisms. Moreover, the HIE Governance entity will formally coordinate activities with both the California Privacy and Security Advisory Board (CalPSAB) and regional extension centers to drive to timely and meaningful results.

Role of the State
California State leadership anticipates fulfilling the roles and responsibilities outlined for states in the HIE Cooperative Agreement Program. The Deputy Secretary of Health IT was appointed in the Spring of 2009 to coordinate HIE & Health IT activities across California and to ensure that state resources accomplish the following:
- Develop state level directories and enable technical services for HIE within and across states.
- Remove barriers and create enablers for HIE, particularly those related to interoperability across laboratories, hospitals, clinician offices, health plans and other health information trading partners.
- Convene health care stakeholders to ensure trust in and support for a statewide approach to HIE.
- Coordinate health-related activities across government entities to provide enterprise-wide health services that include disaster recovery and public health reporting.
- Ensure that an effective model for HIE governance and accountability is in place.
- Coordinate an integrated approach with Medi-Cal and state public health programs to enable information exchange and support provider participation in HIE as required for Medicaid meaningful use incentives.
- Develop or update privacy and security requirements for HIE within and across state borders.

Governance Entity Board: The California Secretary of Health and Human Services and the Deputy Secretary of Health IT will hold voting positions on the governance entity's board of directors. At the request of the Secretary of Health and Human, additional seats may be required for the State of California.

Defining State Priorities: State priorities include assurances that hospitals, clinics and other providers are able to demonstrate meaningful use in order to obtain the Medi-Cal and Medicare payment incentives. To achieve meaningful use it is critical that California's health information exchange capabilities are expanded rapidly and are aligned with the specific elements and timeframes required to support meaningful use.

Coordination with Medi-Cal and Public Health: The State will coordinate activities across Medi-Cal, state and local public health programs, and will avoid duplication of efforts to ensure the integration and support of a unified approach to information exchange.

Participation with VA, DoD and IHS: The Deputy Secretary of Health IT will work with the governance entity to engage directly with organizations, such as the Department of Veterans Affairs (VA), Department of Defense (DoD), and the Indian Health Service (IHS) to ensure that the state can meet the

various federal requirements in order to engage in health information exchange with these federal delivery systems.

Identification, selection and contracting for a Statewide HIE Governance Entity: Through the environmental scan that was conducted as part of this strategic planning process, a number of regional and statewide organizations for HIE have been identified. However, no single organization, public or private, is known to have the resources and stakeholder support required to be the governance entity. In August of 2009, CHHS initiated a request for information (RFI) process to identify the closest fit for a governance entity. Through this process the State expects to work closely with an organization to shape it into a governance entity that meets both federal requirements as well as the requirements identified by the State as detailed in the next section. Once selected, California will contract directly with the governance entity to perform statewide HIE convening, coordinating, and management activities.

Role of the HIE Governance Entity
The governance entity will be required to meet the pre-defined organizational criteria, collaborate and support activities across California (including funding mechanisms), and manage contractual, policy, and sustainability activities.

Organizational Criteria:
- Be a not-for-profit organization under California Law.
- Be private-sector led with State government collaboration and representation on the board.
- Have a diverse board composition from multiple types of organizations from regions throughout the State.
- Be seen as a trusted, transparent, independent and collaborative organization for communication, negotiation and decision-making among diverse stakeholders.
- Have the ability to convene and coordinate a statewide public-private collaborative process for Health Outcomes, Privacy and Security, Technical Approach, Sustainability, and Health IT Adoption.
- Abstain from inserting itself into operations except as requested by and driven from the stakeholders.
- Have the ability to manage complex, integrated work streams across stakeholder and subject matter spectrums.
- Have the ability to mature from the foundational tasks of convening stakeholders and coordinating a collaborative process to create and enforce statewide policies and practices.
- Have experience in the development and administration of grant-making processes, consistent with State and Federal guidelines.
- Have the ability to define with stakeholders the need for shared services and the specific means by which those services will be developed and delivered.
- Have experience in securing funds from multiple sources – both public and private.
- Employ robust administrative and financial processes to support transparency and accountability, including adherence to Generally Accepted Accounting Principles (GAAP) and all federal and state laws.

Coordinate Activities across California:
CHHS will work with the governance entity to coordinate activities across California and its many stakeholders, including Medi-Cal, State and local public health programs. The governance entity's primary responsibilities would at a minimum include:

- Develop an operational plan that addresses the key components for statewide HIE identified throughout this strategic plan. It is anticipated that these efforts are substantial and will require consistent effort and coordination to avoid silos.
- Establish a technical architecture that leverages California's information technology infrastructure (e.g., leveraging systems used in California hospitals, providers, health plans, health information organizations, etc.) to enable the rapid propagation of information exchange services across the State.
- Convene a broad array of providers and other stakeholders to agree to and support a set of shared services.
- Determine the most efficient way to spend limited funding to support the priorities of: lab data exchange, pharmacy / Rx history, continuity of care, public health, and other priorities as identified by institutions engaged in health information exchange.
- Perpetuate and support HIE services beyond stimulus funding.
- Adherence to all Federal accountability and transparency requirements as well as the requirements identified in section 4.4 Accountability and Transparency.

**The HIE Governance Entity's responsibilities fall into three primary areas:**

Convene	Coordinate	Manage
• Provide neutral forum for all stakeholders • Educate constituents & inform HIE policy deliberations • Advocate for statewide HIE • Serve as an information resource for local HIE and health IT activities • Track/assess national HIE and health IT efforts • Facilitate consumer input	• Develop and lead plan for implementation of statewide solutions for interoperability. • Facilitate alignment of statewide, interstate, & national HIE strategies, RECs, Medi-Cal, etc. • Coordinate with CalPSAB around privacy and security policies • Promote consistency and effectiveness of statewide HIE policies and practices • Support integration of HIE efforts with other healthcare goals, objectives, & initiatives	• Issue and manage grants • Develop legal analyses • Oversee accounting and budgeting • Possibly contract for statewide shared services such as master patient index • Evaluate and assess progress

Through this plan, a number of measures will be put into place to ensure accountability and transparency of the governance entity, its use of federal, state and private funds, as well as HIE operations. These include:
- A contract between the State and the governance entity.
- CHHS participation on the board of the governance entity.
- A governance structure whereby directors and officers are responsible for working with management to set strategy and adopt policies for HIE operation.
- Documented financial and operational policies and procedures that include reporting mechanisms to track expenditure and activities of the governance entity as well as from any entity to which it grants funding.

- Documentation of organization activities that are open to the public and described in an annual activities report.

The diagram below presents the conceptual view of the relationship between the State, the HIE Governance Entity, CalPSAB and stakeholders.
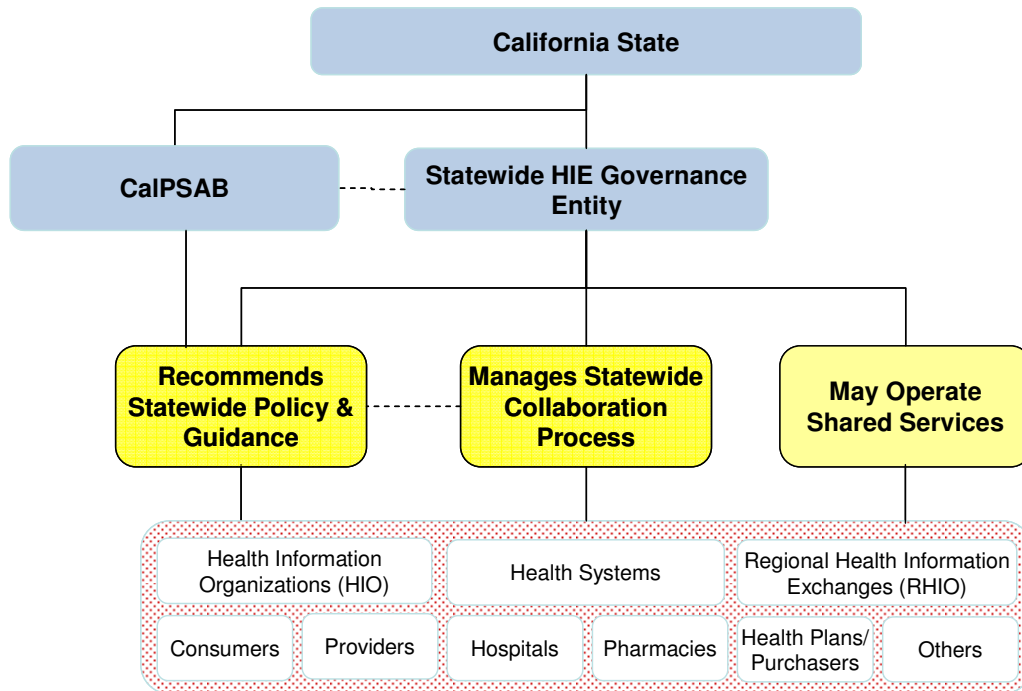
1.4   Funding and Sustainability

The creation of a robust health information exchange infrastructure in California will be somewhat dependent on its ability to secure the financial capital to build infrastructure capabilities and develop ongoing revenue streams to maintain operations. Designing, piloting and implementing interoperable HIE is a complex, multi-year process requiring a long-term commitment of funds. ARRA programs authorized in HITECH represent significant funding streams to jumpstart State upfront capital programs. In addition to the ONC State HIE Cooperative Agreement Program, HITECH includes $34 billion or more in incentive payments to eligible professionals for adoption of meaningful use through certified EHR technology. HITECH also includes the creation and support of regional health information technology centers (RHITEC) to provide technical assistance and accelerate HIE connectivity. Careful consideration must been given on how best to coordinate HITECH grant resources and maximize available efficiencies.

In addition to the HITECH grant funds, HITECH authorizes a 90 percent federal match for expenditures incurred by states in administering the EHR payments and enabling the Medicaid technical architecture to accommodate statewide HIE and health IT adoption. Medi-Cal will work closely with State leadership to explore both start-up capital and ongoing funding options.
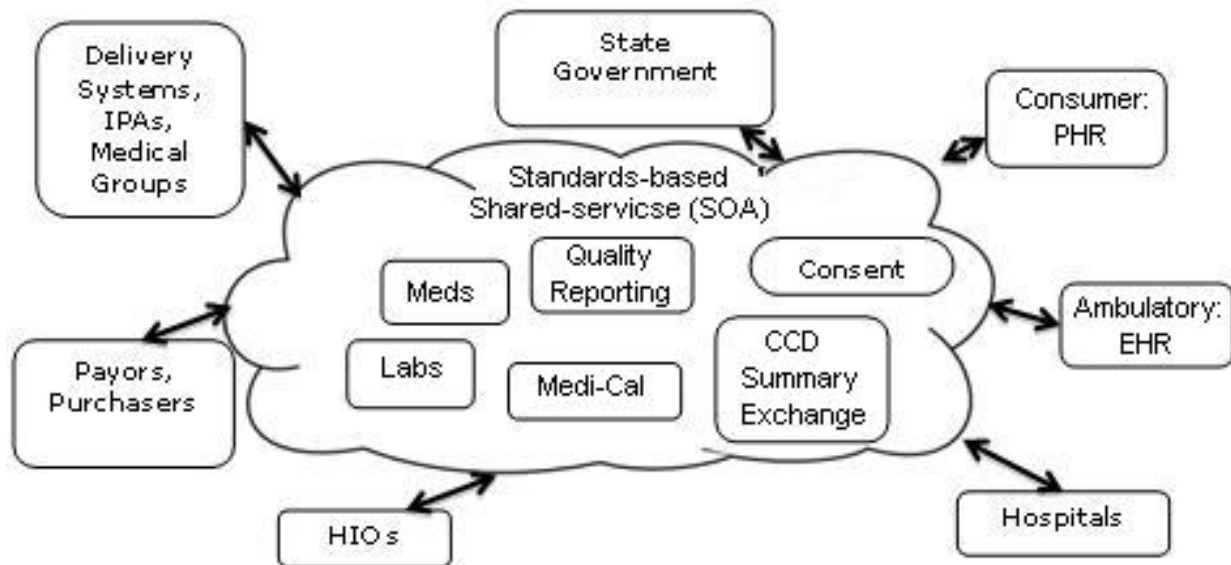
Recognizing that federal funds through ARRA will most likely not meet upfront capital requirements for statewide HIE, California may choose to explore other options that have been effectively utilized by other states including capital budgeting, special purpose funds, and special assessments.

- Capital funding through bonds has been successfully used by several states to support statewide Health IT projects. In Rhode Island, the state established a $20 million revenue bond to create the state's HIE.   The revenue bond is contingent on contributions from other stakeholders such as health plans. The state will pay for the share of costs for public program populations. Given California's current fiscal situation, General Obligation bonds are not likely feasible. An analysis of the potential to use lease-revenue bonds should be undertaken.
- Special purpose funds refer to funding sources that are not subject to traditional legislative appropriation processes, such as settlements derived from legal cases or federal Medicaid waivers.
- Special assessments. The primary objective of a special assessment is to advance a benefit that is targeted in nature.   The Lifeline assessment charged by telephone companies to consumers in California (or in some states) to support low cost services for the very poor is an example of a special assessment.

The goal of achieving statewide interoperability does not end with implementation. In order to remain viable over the long-term, users of HIE must determine that it delivers value and are thus willing to support it. Although states are exploring and in some cases piloting how best to leverage Health IT to support report efforts as pay-for-performance, medical homes, and accountable care organizations, no consensus has emerged for an agreed-upon sustainability model. New models are emerging that leverage HIE to complete transactions electronically that are traditionally processed by paper, such as Social Security Administration's recently announced grant program to process disability claims requests through the connection to the NHIN. The HIE Governance Entity will need to quickly establish a workgroup focused on sustainability of all efforts (including local and regional efforts), the California Telehealth Network and public health reporting.

1.5   Technical Infrastructure

California is committed to a statewide technical architecture that leverages the existing investments of community HIEs and health care providers and allows for regional flexibility while maintaining overall statewide standards and protocols. These efforts have produced outstanding results within their institutional foci. In order to take these efforts to the next level, California must work to create a technical architecture that will integrate these independent efforts for the benefit of both State- and community-level efforts. By adopting a standards-based approach to interoperability, California can create an environment that enables the development of shared services based on existing capabilities where possible. In addition, California can align these efforts to satisfy the requirements for ARRA funding, especially by creating services that fulfill meaningful use criteria.

Delivery Systems, IPAs, Medical Groups

State Government

Consumer: PHR

Standards-based Shared-servicse (SOA)

Quality Reporting

Consent

Meds

Labs

Medi-Cal

CCD Summary Exchange

Payors, Purchasers

Ambulatory: EHR

HIOs

Hospitals

California favors a neutral connectivity model. A direct peer-to-peer connection approach will allow any entity that meets the criteria to connect and be both a provider and consumer of services. This neutral model has the most flexibility to adapt to California's complex healthcare ecosystem, where many large institutions have significant geographic distribution across California. A further advantage is that any entity can be a shared service provider, making it easier to leverage existing capabilities.

The statewide technical architecture to implement the neutral conductivity model is defined by principles, patterns and processes as described below. The principles that follow will achieve a flexible and adaptable statewide technical architecture:

- An open and inclusive process to identify community need, (hospitals, providers, etc.) and priorities and define the value proposition.
- Identify and deploy shared services in alignment with "meaningful use" as defined by the federal government. California has substantial capabilities based on the enormous investments already made, and these investments should be leveraged into shared services available on a statewide basis.
- Build upon federal standards and implementation efforts.
- Adoption of protocols based on open standards. The use of protocols enables 'loose coupling' so that different systems can proceed with independent development and yet interoperate through the adopted protocols.
- Use the latest binding possible. Late binding allows for flexibility of a system by delaying binding a specific implementation until there is sufficient information to make a precise choice.
- Vendor and technology neutrality.

Architectural patterns describe coherent frameworks that help guide implementations. California will base its statewide technical architecture on these patterns:

- Service Oriented Architecture (SOA) is a well understood architectural pattern that defines services implemented by service providers and utilized by service consumers.

- Enterprise Service Bus (ESB) is an architectural pattern often used to implement SOA. It provides a mediation layer that has advantages when implementing SOA.
- Peer to peer services topology: This pattern specifies that there are no constraints on the connectivity allowed between service providers and consumers. This is the most flexible connectivity pattern, enabling any service consumer to connect to any service provider.

The HIE Governance Entity will bring together California's state and private technical leaders to pursue the following activities:

- Develop a collaborative process with strong technical representation from stakeholders so that the technical architecture is consensus-based and practical.
- Develop use cases that span multiple systems as well as multiple entities.
- Prioritize implementation activities to correspond to meaningful use objectives.
- Develop policy guidance for the minimum necessary statewide technical architecture to enable practical implementations based on the architectural patterns; for example, specifying service level agreements for service providers.
- Ensure access to Medi-Cal data and other State health-related resources to create interfaces that are interoperable with these assets.
- Develop the enforcement mechanisms to ensure adherence with technical and policy guidance.
- Identify and prioritize candidates for shared services, and coordinate implementation.
- Leverage the collective power of the collaborative to create favorable arrangements with service providers.
- Work with other states that are engaging in similar efforts and incorporate applicable best practices.

1.6   Privacy and Security

California has adopted state statutes that establish standards for confidentiality of personal health information. The California Privacy and Security Advisory Board (CalPSAB) has been established under the auspices of the Secretary of the California Health and Human Services Agency as a platform for collaboration between government and the private sector to coordinate HIE privacy and security policy in California.

CalPSAB has conducted a detailed inventory and analysis of the existing state laws in California that apply to privacy and security of personal health information, and has established a set of initial priority targets to rationalize and harmonize existing policies and requirements that often conflict with one another and are not uniformly applied. CalPSAB has established a multi-year agenda of tasks and a committee structure to endeavor to deal with the issues it has identified.

The HIE Governance Entity will work with CalPSAB and address privacy and security policy issues. CalPSAB will be charged with developing specific privacy and security rules that will achieve the following objectives:

- Assure security in the exchange of clinical data.
- Achieve clarity and uniformity in the application of privacy and security rules.
- Facilitate data exchange for clinical purposes.
- Coordinate California's requirements with evolving rules at the federal level.

- Endeavor to harmonize disparate requirements of neighboring states to enable efficient administration.

1.7   Evaluation

California is dedicated to demonstrating that progress has been made by employing a robust evaluation program. The goal of the evaluation effort is to demonstrate the value of Health IT & HIE investments and the effects of these investments on providers and consumers, determine what is working and what needs to be improved, disseminate these lessons learned broadly within the state as well as at a regional and national level, and iteratively refining how Health IT and HIE are deployed in the State.

California will allocate a portion of the funding received through the State Health Information Exchange Cooperative Agreement Program to an independent evaluation process. As long-term funding is defined, it will include a mechanism to fund on-going evaluation and analysis. The state and the Governance Entity will work jointly together to define the details of the evaluation process as part of the Operational Plan. In addition, California will leverage technical assistance offered from the federal government. The evaluation process will include continuous evaluation, reassessment and revision of the State strategic and operational plans. The evaluation will be coordinated with the national program evaluation and specific reporting requirements described within the ONC State HIE Cooperative Agreement program will be incorporated into the evaluation.

2   Regional Extension Centers

2.1   Overview

The American Recovery and Reinvestment Act (ARRA) of 2009 delivers funds to support providers in adopting and meaningfully using connected health information technologies to deliver high quality care. However, the adoption of complex technologies such as electronic health records is not simply a "plug-and-play" operation. In order to achieve meaningful use, California providers will need expert assistance in a range of areas related to technology implementation, from an initial needs assessment and workflow redesign to purchasing systems, training, and submitting meaningful use progress reports. Through the Health Information Technology for Economic and Clinical Health (HITECH) Act, the Office of the National Coordinator for Health IT (ONC) has proposed to establish and partially fund Regional Extension Centers (RECs) across the country to offer providers critical support to modernize health care delivery in support of health reform.

A California Health Information Technology Extension Center program (Cal-HITEC), will extend comprehensive technical support to help providers deliver the best, cost-effective health care. Cal-HITEC will help California lead the nation in delivering high-value health care services and implementing new, more cost-effective care delivery models, meeting the challenges facing our large and diverse population. Ultimately, Cal-HITEC will help actualize the goal of a healthier California by working towards improved health outcomes, increasing outreach for prevention services, public health, and identifying targeted interventions in the future.

There are three goals for Cal-HITEC:

1. To provide comprehensive support and assistance to providers seeking to advance readiness, adopt and become meaningful users of health information technology, with a focus on the special needs of underserved communities and populations.
2. To collect, develop, and disseminate a broad array of technical assistance services and tools to facilitate the selection, implementation and meaningful use of certified electronic health records (EHRs) supported by health information exchange.
3. To identify and disseminate best practices and education throughout the workforce to accelerate efforts to adopt and effectively utilize health information technology.

To prioritize and coordinate activities across the State, California will support the creation of two Cal-HITEC extension centers supporting urban and rural providers in Northern and Southern California. Given the size, scope and diversity of California's health care system (described in the table below) two RECs are required to provide adequate local support to the prioritized providers.

Prioritized Provider Type	Count in State	EHR Implementation Status
Public Hospitals	15	Varied levels of implementation
Rural Hospitals	59 Hospitals	Varied levels of implementation
FQHCs, Community and Free Clinics	Over 900 licensed clinic delivery sites	4% used EHRs in 2006 but many use chronic disease registries
Primary Care Providers in practices with 10 or fewer prescribing professionals	12,000 - 14,000 PCP physicians	12-20% had EHRs as of 2008

Sources: (1) Miller, et. al. Barriers to Financing Clinical Information Systems in California Healthcare Delivery System Organizations: Report to the Governor's HITFAC, 2009, (2) California Primary Care Association Data, 2007 and (3) OSHPD Data, June 2008

The REC would offer supporting technical assistance materials to all providers in the State but will target on-site services to priority providers. Priority targets are California health care providers named in the HITECH Act and those who serve medically underserved populations as part of the Safety Net who intend to adopt and become meaningful users of Health IT, including the targets listed above and entities that are located in areas that serve uninsured, underinsured, and medically underserved individuals (regardless of whether such area is urban or rural).

This plan envisions meaningful electronic health record (EHR) implementation as a means to improve health care delivery and enabling health reform. In seeking to fulfill its vision, Cal-HITEC will emphasize education and prioritize efficient, individualized services to those providers who are capable, ready and willing to take advantage of Cal-HITEC services.

2.2   Cal-HITEC Services

Cal-HITEC should develop an affordable and comprehensive services environment to advance readiness of target providers and facilitate an informed decision-making process to select and implement the right products. Cal-HITEC should deliver the following categories of services geared towards assisting providers in acquiring certified EHRs.

Recommended Service Category	Service Components
Needs Assessment	Assess workflow, inventory of data sources, gap analyses to identify EHR readiness and remediation steps, clinical and business process workflow re-engineering, determine qualification for receiving EHR loans and other funding
Product Selection	Creation of business requirements for system purchase, template RFI/RFP documents and contract terms, EHR application functionality, product evaluations, certified vendor lists, standardized EHR contracts for pre-selected vendors, hardware purchasing agreements, loan underwriting facilitation, user groups and support on vendor relations
Acquisition and Implementation	RFPs and contracting support to aggregate small purchaser demand, facilitate purchasing collaboratives, model vendor contracts and provisions, pre-negotiated options for select products, and discounted hardware pricing

Providers in small practices face extreme challenges in adopting complex clinical technologies. Therefore, Cal-HITEC should ensure that its technical assistance efforts include a robust set of technical assistance services to reach the broad array of target providers.

Recommended Service Category	Technical Components
Education on EHR Adoption	Use cases, success stories, general reference materials, communications models to address technology challenges, presentations on planning, selection, implementation, patient-focused education, etc.
Expectation Setting	Identify leadership, staffing requirements, training needs, time commitment, what to expect from the Cal-HITEC and from vendors, assignment of a mentor organization (clinic, hospital, practice, etc.)*
Readiness Assessment	Administer readiness assessments to implement EHR and redesign business and workflow processes, data optimization, and care delivery priorities to optimize use of the technologies. Readiness assessments would include factors such as: Operational readiness/management support*, financial readiness*, IT infrastructure assessment*, IT technical support*, planning support for physicians, staff and users, culture of change*, work process standardization*, information exchange*
Workflow Redesign	Tools, training, and facilitated workflow redesign
Implementation Process	Barriers and solutions, project plans*, checklists, data conversions*, interfaces, testing guidelines, pre-go-live planning*, risk assessments*, go-live support*, vendor management
Training Support	Facilitated support in a multi-methods approach including: Best practice workflows*, relating system use to day-to-day activities*, cheat sheets, computer-based training, "how to" mini videos, virtual classroom training sessions, central support center for 1st level of support during implementation, using EHR to improve quality/efficiency
Post Go-Live Support	Evaluation of meeting meaningful use*, evaluation of use of HIE*, disaster readiness, upgrades and maintenance, HIE readiness, vendor feedback, best practices, central support center

Recommended Service Category	Technical Components
Quality Care and Reporting	Education and integration of population health management and registry use into practice workflow, internal reporting needs* and report, meaningful use reporting, support for aggregated development of reporting to the specific needs of the provider, e-communications with patient, data validation support*, population management support

indicates services that need to be provided at least partially at the provider site

Cal-HITEC would facilitate the development of purchasing collaboratives, learning collaboratives and local support communities, Technology Services Organizations (TSOs), and other mechanisms where small provider organizations can work together, pool resources and support each other.
Cal-HITEC would provide three levels of service to California providers:

- On-site: Individualized, on-site education, selection and implementation assistance following a standardized process.
- Off-site: Off-site education, selection and implementation assistance by phone, email or at the REC office(s).
- Online: General education, reference documents, best practices and user groups.

On-site and off-site services would be performed by "extension agents" or local entities throughout the state in concert with software vendors. These services would require a fee from providers on a sliding scale. On-line services would be made available to all providers in the state and should consist of validated tools received from the National Research Center and through California's network of experienced health IT practitioners and training institutions.

2.3   Cal-HITEC Structure and Governance

Cal-HITEC would be comprised of an administrative body and local entities (LEs). The administrative body should consist of a consortium of organizations representing the target market and serving collectively to manage and coordinate the activities of LEs. The major roles for Cal-HITEC are listed below:

- Oversee LE activity to provide a consistent level of service across the state.
- Manage budget, fundraising and fund distribution throughout the operation.
- Support a collaborative clearinghouse for best practices and education on health IT and meaningful use.
- Ensure a full continuum of technical assistance provision to target providers across the State.
- Identify and promulgate standardized processes for EHR implementation; ensure standards are met by local extension agents.
- Vet a set of software products and LE technical assistance staff and consultants to be supported by the REC to ensure high quality and affordable implementations for target providers.
- Negotiate preferred EHR contracts with 2-5 vendors for private practices, community clinics, rural health centers and hospitals. Support group purchase of hardware.
- Coordinate outreach and communication to target providers, including information about loan opportunities.
- Coordinate evaluation, quality improvement and Federal reporting activities.

- Support workforce development through training and internship opportunities.

LEs would serve as the primary vehicle for conducting technical assistance focused on EHR system adoption and integration with other Health IT systems. To deliver these services, the LEs would employ or contract with consultants/staff who meet a minimum standard of training and experience to achieve "vetted and approved" status. This will ensure that target providers have access to resources capable of assisting a Health IT implementation in small and underserved provider communities, minimizing the potential for failure.

Beyond providing technical assistance, the LEs would facilitate training for existing staff at the provider sites and recruit individuals to the area with needed skills in Health IT adoption and implementation. The LEs would be required to share educational material that they develop and data collected on best practices with their local community and with Cal-HITEC.

LEs would be distributed across the State, representing a range of knowledge in terms of provider focus, urban/rural expertise, and specialized technical assistance services (which may be different for hospitals, clinics and practices). The LEs would capitalize on virtual collaboration to share knowledge across these sectors. A LE could receive funding support from Cal-HITEC and from user fees. Examples of LEs include, but are not limited to: Independent Physician Associations (IPAs), Foundations for Medical Care and Medical Societies, hospitals, community clinic/consortia and others.

Centralized Services (Cal-HITEC)*	Services Provided Locally (LEs)
• Group Purchasing of 2-5 EHR Products • List of vetted/approved products and consultants, standardized EHR contracts, hardware group purchasing, etc. • Online support, educational materials, and learning collaboratives • Evaluation of LE services and Federal reporting • Coordination with EHR Loan Fund • Coordination and management of HIT Practice Consultant certification and Internships • Payment of LEs for provider assistance • Development of standardized processes to be used by LEs	• On-site and off-site services tailored to individual providers • HIE Support • Identification of potential candidates for funding support • Documentation and dissemination of training materials and best practice data

*Cal-HITEC may also provide local services for providers where LEs are not accessible

There are multiple mechanisms Cal-HITEC will employ to ensure accountability and sustainability:

1. *Memoranda of Understanding between Applicant Organizations.* The Cal-HITEC lead applicant would establish Memoranda of Understanding (MOUs) with the administrative consortium organizations to delineate relationships and establish fiscal priorities.

2. *Board of Governors.* Cal-HITEC would maintain a Board of Governors to establish, evaluate and monitor the progress of REC activities. The Board would consist of applicant organizations, representatives from the LEs as well as other stakeholders that will hold Cal-HITEC accountable in meeting its stated objectives. The Cal-HITEC Board would help to coordinate its REC effort with California's multiple Health IT initiatives, including health information exchange, telehealth, public health informatics, EHR loan and workforce efforts.

3. *Contracts between Cal-HITEC and LEs.* Contracts between Cal-HITEC and the LEs would serve as the primary mechanism by which the Cal-HITEC would oversee the activities and track the progress across the State. Contracts would detail any standard procedures the LE is expected to follow, the LEs relationship to Cal-HITEC, principles for statewide service offerings, and participation on the Cal-HITEC Advisory Board. The contract would also include evaluation metrics that the REC would use in determining whether to renew or terminate the contract with the LE using benchmarks adjusted by provider population. Proposed evaluation metrics include:

- Established benchmarks and documentation of continual performance improvement.
- Number of priority providers served (clinic, hospital, physician, other) and percentage of total in each category.
- Number and percent of priority providers served that meet their milestones and move through the stages of a health IT implementation, including the number and percent of providers who receive meaningful use payments.
- Cost and resources expended per provider served by stage.
- Growth of providers being served in each category.

The figure below illustrates the governance relationship between Cal-HITEC and the LEs.

Governance Structures within Cal-HITEC
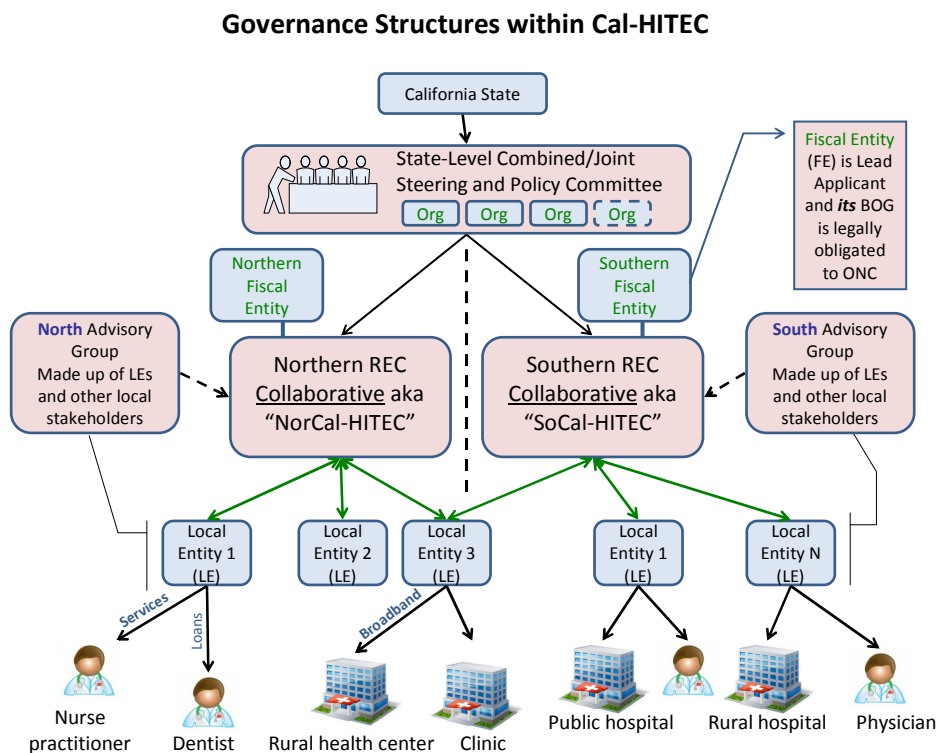
2.4   Cal-HITEC Funding and Sustainability

The RHITEC Funding Opportunity Announcement requires each REC to serve at least 1,000 providers and become sustainable within 2 years. Ongoing funds to support Cal-HITEC activities may come from a variety of sources including provider fees, Loan Fund dollars and ongoing private donations:

- User Fees: Cal-HITEC will charge target providers subsidized fees for their on-site and off-site services on a sliding scale to sustain the REC and ensure that providers have some buy-in to the process and adequate capital to support EHR implementation.

- EHR Working Capital Fund: The EHR Loan Fund will offer working capital to support LE services by supporting providers who utilize LE services to achieve meaningful use. In order to facilitate receipt of the funds, Cal-HITEC will administer a process by which LEs have the opportunity to apply for and deploy working capital for underserved providers, which will be repaid from the provider's meaningful use incentive payments. The capital risk will be pooled at the Cal-HITEC level and the fiscal entity would maintain a reserve to cover defaults.

- Medicaid Incentive Payments: Cal-HITEC may be eligible for up to $1,487.50 per Medicaid ambulatory provider it assists as the REC could be an entity "designated by the State" to support EHR adoption. The Cal-HITEC Board of Governors, with the State, should work with Medi-Cal to pursue these dollars to support assistance to "Medi-Cal oriented" providers.

- Stakeholder Grants/Donations: Consultants, vendors, large providers, employers and payers should be candidates for providing initial and ongoing funds to support Cal-HITEC.

2.5   Quality and Reporting Metrics

After determining baseline EHR adoption levels among target providers, Cal-HITEC will set quarterly goals for driving EHR penetration rates. Potential process/outcome measures include:

- Meaningful Use Payments: How many prioritized providers received meaningful use incentive payments?

- Assisted Implementations: How many implementations did Cal-HITEC LE staff support?

- Failure Rate: What percentage of providers that received LE services abandoned the EHR effort vs. the providers who did not receive LE services?

3   EHR Capital Loan Fund

3.1   Overview

ARRA provides incentive payments to certain Medicaid and Medicare providers for demonstrating meaningful use of EHRs. While this funding source will be essential to achieve widespread adoption of EHR, ARRA may also provide resources for loans to support EHR procurements.

The primary goal for the EHR Loan Fund is to supply working capital for EHR upgrade or purchase for "safety net" providers and small practice primary care physicians who do not qualify or cannot access up-front funds for implementation of EHRs. Community clinics, and small and solo practices are a particular focus of the loan fund capital resources, however all physicians, hospitals and physician organizations are eligible to become borrowers, subject to underwriting criteria and availability of funds. Two funds will provide working capital to safety net providers and small practice PCPs: CHFFA loans for non-profit safety net entities, and a Working Capital Program for small practice physicians.

3.2   Medicare Incentives for Eligible Professionals

The ARRA establishes financial incentives beginning in October 2010 for eligible professionals (EPs) who are meaningful EHR users. Beginning in 2015, payment adjustments will be imposed on Medicare EPs who are not meaningful EHR users. The table below summarizes Medicare incentives and penalties:

Year	Adopt 2011	Adopt 2012	Adopt 2013	Adopt 2014	Adopt 2015	Adopt 2016	Adopt 2017
2011 Pmt	$18,000						
2012 Pmt	$12,000	$18,000					
2013 Pmt	$8,000	$12,000	$18,000				
2014 Pmt	$4,000	$8,000	$12,000	$12,000			
2015 Pmt	$2,000	$4,000	$8,000	$8,000			
2016 Pmt		$2,000	$4,000	$4,000			
Total	$44,000	$44,000	$42,000	$24,000	$0	$0	$0
Penalties (% Reduction of Medicare Pmt)					1%	2%	3%

3.3   Medicare Incentives for Hospitals

Incentive payments are provided, beginning with October 2010, for eligible hospitals and critical access hospitals (CAHs) that are meaningful EHR users. Reduced payment updates beginning in FY 2015 will apply to eligible hospitals that are not meaningful EHR users. An eligible hospital that is a meaningful EHR user could receive up to four years of financial incentives payments, beginning with fiscal year 2011. There will be no payments to hospitals that become meaningful EHR users after 2015. The total amount for a single hospital cannot exceed $11 million. We estimate the total incentive payments for California Hospitals will be between $1.5 and $2 billion.

MEDICAID

HHS develops interoperability standards (end on 2009)

Incentives begin

Standards completed

Hospitals that adopt after 2017 not eligible for incentives

Physicians' first-year costs reimbursed until 2016

Nonhospital-based physicians receive payments through 2021 or for no more than 5 years

2009   2010   2011   2012   2013   2014   2015   2016   2017.....   2021

Incentives begin on October 20 for hospitals

Medicare phases out incentives for physicians

Penalties begin for nonmeaningful use (FY2015 for hospitals, calendar year 2015 for physicians)

Incentives begin on January 20 for nonhospital-based physicians

Physicians whose first payment is after 2014 receive no incentives

Incentives end

MEDICARE

Source: Manatt Health Solutions.

3.4   Medicaid Incentives for Eligible Professionals

Calculating Incentives for Medicaid providers is significantly more complicated. The total reimbursement amounts are up to $65,000/provider over five years. Unlike Medicare providers, who are only paid upon achieving meaningful use, Medi-Cal providers can access payments for implementation. Eighty five percent of first and second year costs of purchasing, installing and training purposes can be reimbursed from these payments, up to the applicable limit. Medicaid payments have an extended time horizon that goes up to 2020. Providers must demonstrate that a certain percentage of patients (20-30% depending on provider type) are covered by Medicaid.

At the writing of this plan, the assumption is that the Medicaid meaningful use incentives will be made available to eligible Medicaid providers IN ADVANCE of acquisition of the E.H.R. and may be used as working capital for the upfront investment of resources to become a meaningful user and to receive the remaining meaningful use incentives. The table below summarizes the incentives for Medicaid providers.

Summary of Medicaid Incentives for Providers

Year	Adopt 2011	Adopt 2012	Adopt 2013	Adopt 2014	Adopt 2015	Adopt 2016	Adopt 2017
2011	$25,000						
2012	$10,000	$25,000					
2013	$10,000	$10,000	$25,000				
2014	$10,000	$10,000	$10,000	$25,000			
2015	$10,000	$10,000	$10,000	$10,000	$25,000		
2016		$10,000	$10,000	$10,000	$10,000	$25,000	
2017			$10,000	$10,000	$10,000	$10,000	$0
2018				$10,000	$10,000	$10,000	$0
2019					$10,000	$10,000	$0
2020						$10,000	$0
Total Incentives	$65,000	$65,000	$65,000	$65,000	$65,000	$65,000	$0

Community Clinics and Health Centers: There are 180 clinic corporations in California. Of the universe of community clinics, FQHCs have had a range of opportunities to access financial resources to fund their EHR implementations, including but not limited to Federal HRSA grants (CIP and others). In total, they could be expected to receive $47 million in Medicaid incentive payments in addition to other grants, to cover $36 million in costs, with approximately $18 million up front. However, non-FQHC clinics, totaling more than 100 organizations, may not benefit from targeted grant funds. These organizations will need access to additional working capital to purchase and implement EHR.

Public Hospitals: The HITFAC report estimates that the capital needs for this segment are $300 to $450 million in 2007-08 with Los Angeles county accounting for approximately half of the estimate. The total amount of incentive payments available for these hospitals is not easily calculated. Public hospitals could receive an average of $13,953 per bed plus $2 million base payment, capped at $11 million, for a total of about $140 million. This will leave a gap of $160 to $310 million, according to HITFAC. Most public hospitals have access to the municipal bond market pending approval from their Board of Supervisors and/or City Councils to incur debt. Both incentive payments and some kind of debt proceeds will be needed for widespread E.H.R. adoption.

Rural and Community Hospitals: The HITFAC report estimates rural hospitals likely needed $100 to $150 million in capital to adopt an EHR. These hospitals tend to have lower occupancy rates and will be expected to receive lower incentives per bed, offset when these hospitals receive the $2 million in base payment plus additional incentives. Using a revenue ratio compared to public hospitals, they are expected to receive up to $195 million in incentive payments, which should be adequate to capitalize their EHR installation. Assuming that rural hospitals receive Medi-Cal funding up-front, which should exceed $100 million in base payments alone, they should not need additional loan funds. Most hospitals raise capital through bond offerings and may not need or want assistance. The exception may be unaffiliated community hospitals, many of whom are currently experiencing difficulty in launching successful bond offerings.

Solo and Small Practices: There are an estimated 40,000 solo and small group physicians in California. Only 12-20% of solo and small group physicians likely use EHRs and solo/small group physicians were less likely to have EHRs than are physicians in larger groups. Assuming an EHR system costs around $50,000, the capital need for this segment is around $2 billion. Complementary incentive payments would reach $1.92 billion, with a gap of $80 million.

Large Physician Groups: Approximately 20,000 California physicians practice as part of large medical groups greater than 10 providers, with 11,000 working for Kaiser and the balance working for other organizations. According to the Health Perspectives in California 2007 Survey of Primary Care Physicians by Harris Interactive report, approximately 5,500 of the non-Kaiser large groups use EHRs and we expect they will be able to transition to meaningful use without significant costs. The remaining 3,500 physicians will require $175 million in capital and can expect $168 million from incentive payments, leaving a gap of $7 million.

Independent Practice Organizations: Large physician organizations dominate the California delivery system with over 300 medical groups and independent practice associations (IPAs). Approximately 70 IPAs currently assist physician practices of all types adopt EHRs. In order to expand the capacity of these organizations to assist the state to achieve widespread adoption, they will need additional working capital and trained and competent implementers. The REC, the Workforce Initiative and the Working Capital fund should all be inclusive of and directed towards the IPAs. While access to capital for the physician organizations[2] varies by non-profit and for-profit status, size of practice/organization, and other factors, access to the loan fund shall remain open to all creditworthy borrowers on a prioritized basis, pending availability of adequate funds. At the same time, because of historic lack of access to capital, priority will be given to physician organizations borrowing on behalf of solo and small practice physicians.

3.5   Summary of Capital Needs

Assuming the Medi-Cal up-front payments are available, the remaining segments of the market with the least access to working capital and the greatest need are the non-FQHC Community Clinics and the small and solo practice physicians. According to California's Health IT Financing Advisory Commission (HITFAC), the estimated capital needs for the non-FQHCs is $13 million over seven years, with start-up costs of at least $5 million. CHFFA is well-poised to meet the start-up capital needs for this segment at very competitive rates.

Small practices are still financially challenged, particularly when the incidental costs and first-year productivity losses are factored in. Physicians will be offered low-cost, highly supported solutions that can get them to meaningful use. In order to do so, capital must be available in advance of meaningful use payments via the Working Capital Program. Approximately 24,000 physicians fall into this category; half may have the means to "go it alone." The remaining small practice physicians may choose capital assistance from their Regional and Local Extension Centers.

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[2] Including but not limited to independent practice associations, management services organizations representing physicians and other qualifying providers, medical groups, physician and/or clinic consortia, local extension centers, etc.

The following describes the loan products that will support the needs of those with the least access to capital.

3.6 EHR Loan Fund Programs

Two loan programs for the purchase of EHR are recommended to meet the needs for different segments of the provider community: the California Health Facilities Financing Authority (CHFFA) Loans and the Regional Extension Center Working Capital Program. The intended uses of loan funds are to implement items and services in the form of hardware, EHR software applications, interfaces, network infrastructure, Internet access, information technology implementation, project management, data conversion and training services that are necessary and used solely to obtain meaningful use of EHRs.

California Health Facilities Financing Authority Loan Program

The California Health Facilities Financing Authority (CHFFA) is a state agency in the State Treasurer's Office created to help nonprofit safety net providers finance capital improvement projects and other needs. Loans are available to private, not-for-profit health-related corporations for up to 95% of the purchase price of EHRs. Loans up to a maximum loan amount of $750,000 at 3% fixed interest rate over 15 years are available. Funds may also be used to refinance an existing loan.

Regional Extension Center Working Capital Program

The Regional Extension Center Working Capital Program will provide working capital to prioritized providers who do not have access to funding form implementation through Medi-Cal or CHFFA. This segment primarily consists of small practice physicians and non-FQHC community clinics that are not eligible for Medi-Cal payments and don't meet the CHFFA underwriting criteria. The program would "guarantee" meaningful use and be administered as follows:

- The REC solicits a $52 million pool of funds from stakeholders at a 2% interest rate or applies to ONC for grant funding of the program.
- The REC sets aside 10% to cover "no-fault defaults" from grants or other sources.
- The REC selects a hardware and software vendor for the program.
- The REC sets Local Entity consulting fees and milestone payments at a standard rate.
- The REC creates standardized criteria for participation in the program.
- Local Entities submit a list of eligible providers who are ready to install EHRs and achieve meaningful use (ongoing).
- Eligible providers sign contracts that commit them to the process and pay a participation fee.
- The REC reviews the applications for final approval.
- The REC pays the hardware and software vendors and local entities directly for approved providers according to negotiated terms.
- Providers pay the REC directly over three years out of their meaningful use payments.
- Providers who do not achieve meaningful use but follow the well-documented REC procedures and processes do not have to repay their loan. Providers that do not act in good faith will have to pay back their loans less recovered costs.
- If the program is successful, the REC will continue to solicit funds and enroll as many providers as possible.

Potential Working Capital sources include: Federal Grants, Payers, Vendors, Research Institutions, Medical Device and Pharmaceutical Companies, Large Employers, Non-Profit Consumer Groups, Medical/Hospital Societies, Revenue Bonds, General Obligation Bonds, and Foundations

The EHR Loan Fund should require interest of 2-3% over the cost of funds with payments due over three years when meaningful use incentives are received. Standard contracts should be developed between providers, local entities and the REC; the latter cannot be considered lenders. In order to maintain and sustain the loan fund, the following principles must be observed:

- Reserve and prepare for 10% defaults.
- Train the local entities and maintain strict adherence to procedures.
- Disburse funds incrementally according to achievement of goals and milestones
- Share risk wherever possible.
- Track local entities default rate and limit/prohibit funding to organizations that exceed the 10% rate.
- Require up-front financial participation from providers on a sliding scale.

4 Workforce Training and Development

4.1 Overview

The $32 billion in Health IT stimulus funds provided through the American Recovery and Reinvestment Act (ARRA) will create unprecedented growth in demand for EHRs in a short period of time. Meeting this demand is not as simple as producing and selling more EHRs. Selecting, buying, installing, customizing, integrating, training and maintaining electronic health records is a complex and time consuming task, requiring expertise in a number of highly specialized fields. The new financial incentives made available through ARRA combined with the accelerated timeline for installing EHR and other Health IT services make it clear that the existing Health IT workforce will be insufficient to meet this dramatic increase in demand.
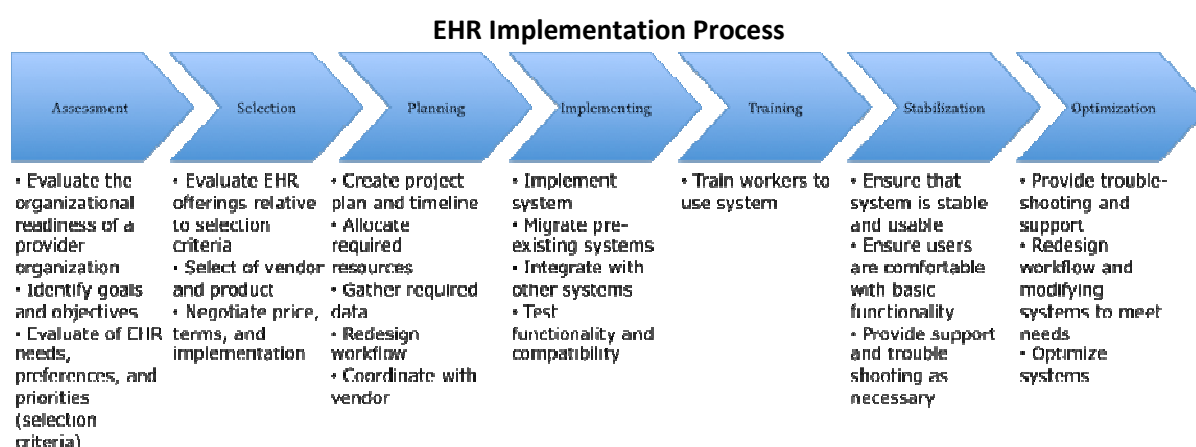
The HITECH portion of ARRA provides an unspecified portion of the $2 billion pool of ONC funds for which academic institutions or consortia thereof can apply to help prepare for and train workers to support EHR adoption. In addition, the US Department of Labor (DOL) will provide $220 million in grants for workforce development, including Health IT workforce. Both the DOL and ARRA funds can provide critical support to help California prepare the necessary Health IT workforce. By understanding the magnitude and characteristics of projected demand for a qualified Health IT workforce and the opportunities to meet this demand, California will be better prepared to organize stakeholders to collaborate and put these funds to effective use.

It is projected that 9,000 additional Health IT workers with a broad range of skills and training will be required to support widespread EHR adoption in California over the next five years. Given the magnitude, characteristics, timing, and geographical distribution of the projected demand for HIT workers, a coalition of educational institutions must collaborate on this initiative and build a governance structure and sustainability model.

4.2   Findings

There are a number of challenges associated with projecting demand for Health IT professionals and recommending how the education system can help meet this demand ranging from the lack of research about emerging workforce needs related to Health IT, difficulty in projecting the support needs across the range of provider types and sizes as well as uncertainty about the timing of workforce demands.

Electronic Health Record (EHR) implementations vary widely in their resource requirements based on provider type, practice size, technology selection, desired integration, and much more. This makes it difficult to develop a common staffing model that can be applied to any EHR project. Common tasks necessary for successful EHR implementation are described below:

EHR Implementation Process

Assessment	Selection	Planning	Implementing	Training	Stabilization	Optimization
• Evaluate the organizational readiness of a provider organization • Identify goals and objectives • Evaluate of EHR needs, preferences, and priorities (selection criteria)	• Evaluate EHR offerings relative to selection criteria • Select of vendor and product • Negotiate price, terms, and implementation	• Create project plan and timeline • Allocate required resources • Gather required data • Redesign workflow • Coordinate with vendor	• Implement system • Migrate pre-existing systems • Integrate with other systems • Test functionality and compatibility	• Train workers to use system	• Ensure that system is stable and usable • Ensure users are comfortable with basic functionality • Provide support and trouble shooting as necessary	• Provide trouble-shooting and support • Redesign workflow and modifying systems to meet needs • Optimize systems

Successful EHR implementation requires a diverse set of skills, including a mix of strategic, operational, technical, and clinical skills. The skills can be categorized into the following roles:

• **Project Consultant**: Articulates business case for EHR implementation. Conducts requirements gathering, system selection, vendor negotiation, and readiness assessment and planning.

• **Implementation Specialist:** Health informatician providing strategic vision and guidance for larger implementations (may be done by the Project Manager for small implementations).

• **Project Manager:** Manages implementation tasks to achieve objectives on time and budget.

• **Technology Analyst**: Installs, configures, and tests selected technology according to objectives.

• **Interface Specialist:** Integrates installed technology with health information exchanges and other peripheral systems.

• **Clinical Expert:** Captures clinical and workflow requirements for system selection. implementation, configuration, and integration and supports training.

• **Trainer**: Trains users to effectively integrate EHR into daily tasks**.**

Implementation is more than just installing software; it also involves vital steps around planning and preparation, workflow redesign, training, and optimization. Cost and time limitations lead some

practices to skip or minimize some of these steps, which can lead to suboptimal outcomes. A selection of relevant best practices includes:

- Practices should conduct a strategic analysis and readiness assessment prior to undertaking an EHR implementation[3].

- Training for effective use of an installed system requires a disproportionate share of implementation resources, estimated at one-third to one-half of the total implementation budget[4]. Vendors are not likely to provide exhaustive training services; their focus will be to quickly install their software and provide sufficient but minimal training. Additional training resources, likely independent from vendors, will be necessary.

- Workflow redesign is a critical element of EHR implementations. Practices cannot expect that adding a technology system on top of a broken workflow process will result in improved quality and increased efficiency[5].

- In the few months following implementation, users will be getting accustomed to the basics of a system; most will be unable to grasp deeper functionality. Additional training should take place following "go-live" with the aim of making necessary changes, training on additional features, and meaningful use[6].

4.3   Supply and Demand of Health IT Workers

There are very few resources that can provide accurate information regarding the existing supply of Health IT workers. The Bureau of Labor Statistics (BLS) does not have up-to-date and standard codes reflecting the roles required for EHR implementation or other Health IT functions. Health and workforce researchers have worked to gain insight into this issue, with little success:

- There already exists a well-documented shortage of health workers in general, which will make it hard to recruit new workers out of these roles to meet increased Health IT demand. At the same time, traditional health information management (HIM) roles associated with paper-based records may be rendered obsolete by EHRs, and these workers could be repurposed.

- The California EDD Labor Market Information Division, using Bureau of Labor Statistics data, estimated a total of 125,500 jobs in Health IT related categories in California in 2006 and a projection of 154,100 in 2016. This represents a 23% increase (28,600 jobs). While they provide a starting point, these estimates are not sufficient to project the current supply or the post ARRA Health IT workforce needs because: 1) they were established prior to the expected dramatic increased ARRA generated demand; and 2) the occupational classifications used only

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[3] Texas Medical Association, Electronic Medical Record Implementation Guide, *The Link to a Better Future, 2007*.
[4] Primary research with vendors and providers experienced in EHR implementations
[5] Farzad Mostashari, Micky Tripathi, and Mat Kendall, *A Tale of Two Large Community Electronic Health Record Extension Projects*, Health Affairs, Volume 28, Number 2, March/April 2009
[6] Association of Academic Health Centers 2008, Office of State Health Planning and Development (OSHPD), California State Rural Health Association, UCSF Center for California Health Workforce Studies *Out of Order, Out of Time*

have partial overlap with those required for broad EHR implementation. The potential for having the EDD update these projections to address these issues is being explored.

- The geographic distribution of Health IT professionals is an important factor for widespread Health IT adoption as a nominally sufficient workforce can be effectively insufficient if geographic distribution does not match provider demand. The shortage of health and IT workers in rural areas is a well-documented problem which is likely to affect EHR implementation.

- A large number of workers needed to support EHR adoption may be redirected from other jobs within provider organizations and trained on the job so that there is potential new internal supply source that can be tapped to meet provider demand.

- The growing number of displaced workers from multiple sectors due to the economic crisis may create an opportunity for recruitment and short-term training programs to increase the supply of workers able to support EHR. Returning military veterans could be a valuable source of technically skilled labor.

For all of the limitations inherent in trying to calculate the supply of Health IT workers, estimating and projecting demand can be even more difficult. Accordingly, the following analysis provides a reasonable range wherein Health IT workforce demand can be estimated.

- In 2001, BLS cited a 49% growth in demand for Health IT workers by 2010. Other BLS data previously cited projected a shortfall of 28,600 Health IT workers in 2016.

- Preliminary results from an unpublished AHIMA study that gathered estimates from subject matter experts project a national shortfall of 55,000-75,000 Health IT workers. This would translate to a shortage of 6,600 – 9,000 Health IT workers in California.

- Doctor's Office Quality Information Technology (DOQ-IT) suggested that a ratio of between 1:10 and 1:20 between implementation resources and projects should be sufficient for EHR implementation in small practices. The staffing model used for this report indicates that multiple resources will need to be fully committed to a single project for certain periods, and only be able to maintain a handful of others concurrently.

Analysis resulted in the following projections of demand for Health IT workers:

Health IT Workers	2010	2011	2012	2013	2014
Project Consultant	268	385	503	600	600
Implementation Specialist	307	434	568	672	682
Project Manager	425	588	768	899	910
Technology Analyst	770	1,014	1,325	1,525	1,557
Interface Specialist	333	476	624	743	750
Subject Matter Expert	1,125	1,511	1,978	2,304	2,335
Trainer	1,133	1,520	1,989	2,317	2,350
Total Demand	4,361	5,929	7,755	9,059	9,185
Incremental Demand	2,262	1,567	1,827	1,304	125

4.4   Educational Needs/ Resources

Due to the unique qualifications and requirements of each group, workers within Health IT are categorized (for the assessment and development of education and training resources) as new clinicians, existing workforce and Health IT workers:

- New Clinicians: Clinicians will comprise the majority of ultimate users of Health IT. Physicians, nurses, allied health, and other professionals will all need to have an understanding of and be comfortable using EHR and other Health IT upon completion of their studies, requiring incorporation of Health IT into core curriculum.

- Existing Workforce: Training clinicians already working in provider settings is an equally important task. A unique challenge is that some workers will require training in basic computing skills before they can be proficient in using Health IT applications. Work constraints require that training be done primarily on the job through a combination of vendors, consultants, Regional Extension Centers or other training organizations.

- Health IT workers: Health IT workers will need a broad set of skills to support effective EHR implementation, including strategic, operational, technical, and clinical roles. There will be no single answer to training these workers, but rather a common effort across different types of institutions to train workers at various levels and with a range of skills.

California has a multi-tier educational system with a variety of institutions and programs at each level as resources for this effort:

- Community Colleges: Only seven of California's 109 community colleges offer Associates degrees in Health IT. These programs are located in urban areas across the state in San Diego, Orange County, LA County, Santa Barbara, Fresno, Sacramento, and San Francisco. This program level is deemed consistent with current demand for Health IT workers and could possibly be scaled up to meet increased demand. Other community college programs that could be drawn upon for this effort include Allied Health, Computer Information Systems, Computer Network and Engineering, Computer Science, Nursing, Health Education, Medical Imaging Sciences, Medical Records, Medical Billing, Pharmacy, Physician Assistant, and more.

- Vocational Colleges and Private Certificate Programs Private, for-profit vocational colleges offering AS degrees and certificate programs will represent an important training resource for CA Health IT workers. These programs can be expensive, creating a barrier for certain workers. Only some of these programs and institutions are accredited by CAHIIM and/or regional accrediting agencies (including Western Association of Schools and Colleges). Less oversight and standardization means that students and employers may not know exactly what they are getting and that units may not be transferable as a worker progresses through a career path.

- University Extension: Programs are open enrollment, for-profit ventures affiliated with universities, including the University of California and California State Universities. These programs can be more flexible than other university programs; however, this can lead to a high degree of variability in course content, competencies, and quality.

- Bachelors Level: The University of California System, California State University System, and private universities offer a range of programs relevant to Health IT. UC and CSU train a large proportion of clinicians in California, including physicians, nurses, and allied health, making them

key players in the integration of Health IT into clinical curriculum. Only Loma Linda University has a CAHIIM-accredited bachelors program focused specifically on Health IT.

- Masters and Doctorate Level: Post-graduate degrees in Health Informatics offer a unique combination of health and technical knowledge and are a source for the high-level leaders required for complex EHR projects. There currently exist only a handful of these programs in California, though more are being developed.

Through the use of online learning tools and widespread adoption of high-speed broadband such as the California Telehealth Network (CTN) and linkages to the California's educational broadband network (CENIC) some of this training can be offered through distance learning modalities. This will ensure that training is as geographically accessible as possible to meet the needs of California's rural providers.

It should be noted that traditional educational organizations are not the only places where Health IT workers will receive training. EHR vendors generally have a range of training programs for their products; additionally, many relatively knowledgeable workers will learn on-the-job without formal training. These factors will diminish the load that must be borne by educational institutions in addressing the Health IT workers shortfall.

In order to meet the demand for a Health IT workforce, California will require a coalition of educational institutions meeting the following criteria:

- Hub of knowledge and activity: Single forum for convening, decision-making and programs among key Health IT education, training, employer and government stakeholders, UC, CSU, community colleges and private education and training institutions.

- Health workforce development expertise.

- Infrastructure and capacity to develop and administer federal grant proposals.

- Health IT expertise.

- Neutral broker among stakeholders.

- Access to a variety of funding sources.

- Synergy and integration of Health IT workforce efforts with other major state-wide and regional health workforce plans and initiatives for CA: Forum for sharing promising practices and addressing common needs across professions.

4.5   Recommendations

To develop and sustain a workforce to meet the meaningful use needs of the provider community, the following actions are recommended:

- Build or identify a coalition:
  a. Finalize criteria, identify and screen potential organizations, and select body to oversee the coalition.
  b. Collaborate with relevant labor agencies, including Workforce Investment Boards (WIBs) and Regional Health Occupational Resource Centers (RHORCs).
  c. Explore additional and matching funding sources.

- Integrate Health IT core competencies into training for all clinicians: Section 3015 of ARRA provides funding for demonstration programs and acting to put these in effect should be a top priority of the Consortium. The selected organization should provide a forum for collaboration on funding requests, curriculum and best practice development, and "train the trainers" for clinical education programs.

- Build the immediate Health IT workforce through "crossover" training programs: Section 3016 of ARRA provides funding for existing programs six months in duration or less for training Health IT workers. Short-term certificate programs through the state's wealth of community college, vocational, and university extension programs can offer valuable training to those workers with a portion of the skill set necessary for a variety of Health IT functions. These programs can rapidly respond to meet immediate demand. The Consortium should convene these stakeholders to collaborate on funding requests, curriculum development, and rollout.

    a. Curriculum Development: Curriculum should be updated and standardized to suit the evolving needs of Health IT employers and users.

    b. Hands-on Training: One key roadblock to training students on electronic health records is the limited access these students and institutions have to computing and software resources. AHIMA has set up the Virtual Lab to try to address this problem, but it is under-resourced, leading to expensive access and insufficient functionality. California should do it's part to ensure that this or a similar project is adequately funded, possibly in partnership with the Health IT vendor community, to ensure students have broad-based, affordable access to EHRs in a functional and realistic environment.

    c. Recruitment and Retention: Attaining and keeping students for these programs, particularly ahead of broadly recognized demand for these skills, will require effective promotion and communication of the opportunities that exist, development of programs around the schedules and requirements of the workers likely to make use of them, and making them affordable through aid programs. Utilize the Framework developed by the Connecting the Dots Initiative (funded by the California Endowment) to guide workforce development efforts. Workforce Investment Boards (WIBs) and Regional Health Occupational Resource Centers (RHORCs) can be critical resources and allies in this process as they already possess effective programs and resources to this effect.

    d. Assistance from RECs to train "on-the-job" workforce: Regional Extension Centers should collaborate to deliver training, programs, and services.

- Develop Health Informatics Leaders: While California possesses a handful of high-quality health informatics programs, the highly specialized skill-set required for Health IT leaders is likely to be in short supply.[11]

    a. UC and CSU should consider developing a Health IT Baccalaureate degree or focus area for public health, computer science, and business students.

    b. Health Informatics post-graduate programs currently focused on research applications should be encouraged to develop a focus on clinical and applied health informatics at Certificate, Masters, and PhD levels.

- Develop a system for defining and tracking the Health IT workforce: Accurately counting and monitoring the Health IT workforce is critical to meet these goals. The coalition should work

with OSHPD, the State Labor Agency and others to modify occupational definitions and existing data capture and tracking systems to accurately assess and monitor current and future supply and demand.

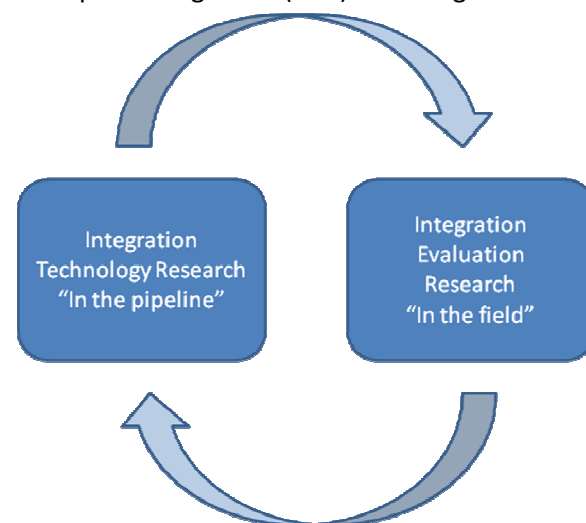# 5 Research & New Technology

5.1   Overview

ARRA provides funds for research and evaluation of research and new technology through the creation of centers for health care information enterprise integration (HIEI). As healthcare practice moves towards adoption of electronic health records, community expectations are that "the use of health information and communications technology in clinical care and clinical research, personal health management, public health/population, and translational science will ultimately improve health.[7]" The rapid development and evolution of Health IT and the exchange of health care information among providers and other health care enterprise entities hold great promise in improving the way health services are delivered.

Coordinated, multidisciplinary research - that is fundamental in approach yet rooted in real-world application - is needed to develop promising health information technologies and to assess their effectiveness in various health care settings. Such technology research spans a wide spectrum of potential use, from innovative devices to alternative means to share information. If made readily available, findings of this research would help inform and improve efforts to promote and support the appropriate use of health information technologies that further health care information enterprise integration, and to educate providers and consumers about the benefits of health information technology. Highly skilled, trained health care and information technology researchers, medical providers, as well as knowledgeable consumers and professionals with critical skills and expertise are needed to collect, evaluate, and disseminate information about available research results.

California will implement a consortium of research centers, based upon Section 13202 of ARRA that states that the Centers for Health Care Information Enterprise Integration (HIEI) shall be generators of innovative approaches to health care information enterprise integration by conducting cutting edge, multidisciplinary research on the systems challenges to health care delivery.

ARRA guidance suggests that in order for the consortium to be successful, its research agenda should incorporate both evaluation research and technology research. In fact, the relationship between these two research foci is natural, and allows for the research direction of the consortium to dynamically respond to needs through a mutual feedback mechanism.

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[7] American Medical Informatics Association. http://www.amia.org

Therefore, a two-pronged research emphasis is recommended. Health care delivery system needs identified through evaluation research inform technology research to respond to those challenges, which in turn requires evaluation in order for the technology to be deployed in real-world health care settings (see Diagram above).

5.2   Recommendations

This plan recommends the establishment of a public-private consortium of research centers ("the Consortium") in the State of California to generate innovative approaches to health care information enterprise integration (HIEI) through multidisciplinary research on 1) the systems challenges to health care delivery, and 2) the development of innovative health information technologies.

The Consortium will promote active collaboration among scientists and engineers from different disciplines, such as health care delivery innovation, information technology, privacy and security, management, social sciences, and other appropriate disciplines. The Consortium will support technology transfer activities to demonstrate and diffuse the research results, technologies, and knowledge; and will contribute to the education and training of researchers and other professionals in fields relevant to health information enterprise integration.

The research and new technologies consortium will bring together medical practitioners, Health IT professionals, basic scientists, engineers, social scientists, patients and business experts. Together these cross-disciplinary teams of experts will conduct research and evaluate technologies to develop strategies and specific action plans that drive adoption of new technologies, methods and practice in clinical and medical settings so as to improve the delivery, management and analysis of healthcare.

The Consortium's mission is to improve health by furthering innovative research on health care information enterprise integration (HIEI). The Consortium will be guided by the following goals and values:

Goals	• Support high quality, cost effective care through Health IT research • Coordinate and enhance research in the state • Support effective development and deployment of Health IT in the field • Produce rigorous evidence and real-world impact • Encourage and educate Health IT researchers and healthcare professionals
Values and Principles	• Trans-disciplinary collaboration • Engage healthcare practitioners and community • Disseminate knowledge • Recognize stakeholder contribution • Promote standardization • Align with national priorities • Measure impact • Take into consideration what can be done today, given the realities of the current technology landscape

The Consortium will function as a research coordinating and dissemination body. Under this model, it represents a collaboration of researchers, health care providers, technology experts and consumers focused on information enterprise integration. It will develop a research agenda based on interests of

the membership that align with state and federal health information technology (IT) and HIE priorities. It will play a vital role in promoting trans-disciplinary collaboration by matching researchers with other stakeholder organizations such as providers, technology companies, and health plans to conduct research on these priority areas. In addition, it will collect, evaluate and disseminate reviews of research on questions relating to the research agenda.

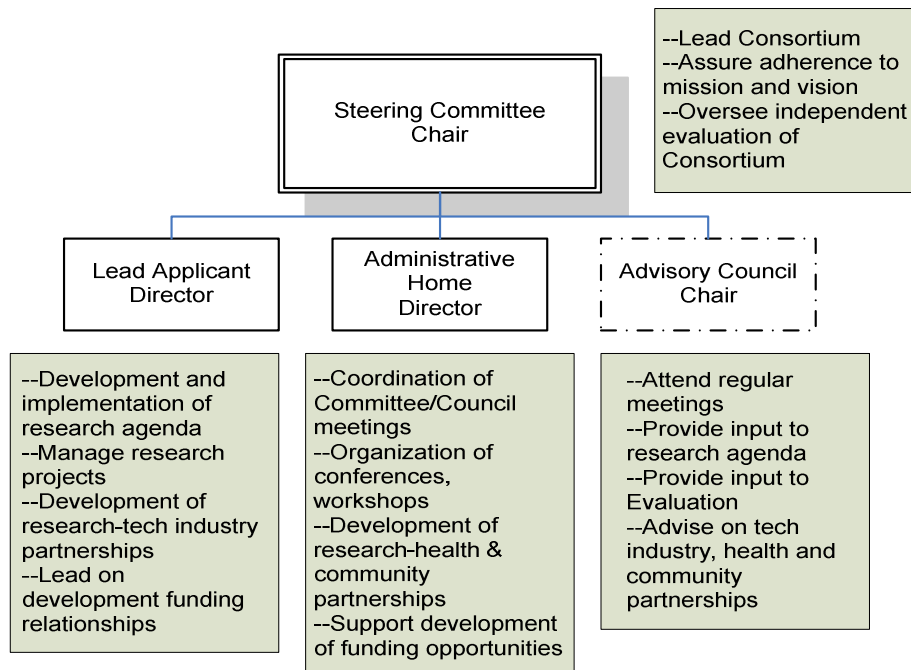The activities of the Consortium will include:
• Research Matchmaking – identify and introduce potential partners for research projects.
• Meta-analysis of Research – conduct reviews of research on priority areas to understand the state of current research, identify gaps in knowledge, and propose projects to address those gaps.
• Research Workshops – conduct workshops to educate non-researchers about research so they can be better informed, critical thinkers and customers of research; conduct workshops to encourage new researchers to engage in health IT research and current researchers to improve their capabilities.
• Portal and Wiki – provide a mechanism for disseminating the Consortium and other research findings to the community and support collaborative research projects.

HIEI research will be conducted at Consortium member organizations utilizing the facilities, employees, researchers, and infrastructure that already exist. The Consortium should not replicate these existing research centers. In accordance with ARRA, research institutions that can apply for funding as a Consortium include academia, non-profit research organizations, and government laboratories. These institutions will make up the Consortium's research membership.

Conducting research to achieve an integrated health care enterprise is a goal that necessarily involves all interested health care stakeholders, not only members of the research community. Therefore, the Consortium will be open to associate member organizations that may include research entities (including for-profit entities), providers, safety net organizations, health plans, employers, technology companies, government, including public health agencies, community organizations and consumer groups as well as other interested stakeholders. Membership fees should be reasonable and priced on a sliding scale.

A steering committee will provide leadership and oversee the activities of the Consortium. A steering committee will consist of representatives from the core institutions that make up the Consortium's research members. A stakeholder advisory council should advise the steering committee on research needs and priorities and provide input and feedback on Consortium activities and services. The makeup of the advisory council should be reflective of non-research members.

Recognizing that the Consortium has a mission encompassing both research and community benefit and in alignment with the collaborative nature of the Consortium, a collaborative approach should be used in leading and managing it. The lead applicant for submitting a proposal to the federal government for funds to initiate the Consortium will be a California academic institution with a national reputation and success in HIEI research. The administrative home will also be a California academic institution that has expertise in collaboration and community engagement. These institutions are not the only recipient of funds from any grant proposal. Rather, research funding will shared among all members who conduct research.

Steering Committee Chair

--Lead Consortium
--Assure adherence to mission and vision
--Oversee independent evaluation of Consortium

Lead Applicant Director

--Development and implementation of research agenda
--Manage research projects
--Development of research-tech industry partnerships
--Lead on development funding relationships

Administrative Home Director

--Coordination of Committee/Council meetings
--Organization of conferences, workshops
--Development of research-health & community partnerships
--Support development of funding opportunities

Advisory Council Chair

--Attend regular meetings
--Provide input to research agenda
--Provide input to Evaluation
--Advise on tech industry, health and community partnerships

Technology research projects undertaken by Consortium member researchers would seek to address one or more data exchange issues above as they relate to a health-related functional domain. Areas of research may include the following:

- Interfaces between human information and communications technology systems.
- Voice-recognition systems.
- Software that improves interoperability and connectivity among health information systems.
- Software dependability in systems critical to health care delivery.
- Measurement of the impact of information technologies on the quality and productivity of health care.
- Health information enterprise management.
- Health information technology security and integrity.
- Relevant health information technology to reduce medical errors

The following charts reflect recommended criteria to establish a technology research framework and an evaluation research framework.

Key Technology Research Areas

Quality of Data Exchange	Research Area
Useful	Adoption, meaningful use, application of data (e.g. quality measurement, surveillance, decision support, etc.)
Seamless	System interfaces, multi-platform computing (e.g. mobile), user interfaces
Lossless	Data integrity, data modeling
Computable	Semantics, knowledge management

Quality of Data Exchange	Research Area
Searchable	Data mining, data identification (including patient identification)
Secure	Data privacy and security
Reliable	Storage, transmission, scale
Lawful	Privacy, governance, data exchange policy
Affordable	Low-cost computing approaches, management
Sustainable	Health policy, business modeling
Appropriate	Context management, authentication and access management

Key Evaluation Research Areas

General Research Topic	Specific Research Areas
Needs assessment	Where is HIEI most needed? For which patients/providers? Which data elements are most desired?
Usage of HIEI	Adoption, Usage. Who is using (provider/patient characteristics), how much are they using it, and how has HIEI impacted workflows?
Financial impact of HIEI	Societal vs. payer vs. provider vs. patient costs/benefits, initial costs vs. maintenance costs, eventual CEA/ROI analyses
Quality impact of HIEI	Effect of HIEI on process and outcomes
Safety impact of HIEI	Effect of HIEI on medication errors and adverse drug events
Consumer satisfaction with HIEI	Including views on how HIEI has affected patient care, privacy, and security
Provider satisfaction	Satisfaction with: UI, new workflow, usefulness of exchanged data, data elements exchanged.
Platform evaluation	Completeness, timeliness, & accuracy of data transfer.
Public health	Use of integrated data for biosurveillance. Use of data feedback to providers to promote public health practices (i.e. immunizations).
HIEI program evaluation	Evaluation as a social program
How HIEI enables/improves research	Use of HIEI in research

Specific research topics will largely depend upon guidance provided by the anticipated NIST Request for Proposals is released. The following are guidelines for selection of appropriate topics.

- A total of 3-5 research topics are recommended for the initial work of the Consortium.
- Topics should fit within the integration research framework as described above.
- Topics should also be compelling to research members and fill a gap in knowledge.
- A series of use cases have been developed to illustrate HIEI in a variety of real-world settings (see the workgroup report appendix). Specific research project ideas should be grounded in the integration challenges raised by use cases.
- Research topics should seek to meet the unique health care integration challenges in California. For example, the scalability of secure health data exchange approaches is of particular concern to California.

6   Broadband & eHealth

6.1   Overview

Broadband connectivity is a foundational and overarching component necessary for the successful development and implementation of Health IT and HIE. eHealth services throughout the State should be delivered using a coordinated and integrated system that (1) delivers eHealth Services that cover the entire healthcare spectrum including healthcare education and emergency response, 2) leverages existing services and resources, and 3) coordinates existing efforts with new state initiatives including RECs and HIE.

6.2   Current Landscape

In January 2008 the California Broadband Taskforce concluded that ubiquitous broadband services are "…an integral part of improving the overall health of Californian's and driving down the cost of care"[8]. The availability of ubiquitous broadband will support the implementation of various technology-supported health services, or *eHealth*. Technologies used in eHealth include videoconferencing, the Internet, store-and-forward imaging, streaming media, and terrestrial and wireless communications.

> *eHealth* is a broad term that, for purposes of this report, includes Telehealth, Electronic Health Records, Health Information Exchange, and Privacy and Security. *Telehealth*, as defined by Health Resources and Services Administration (HRSA) Office for the Advancement of Telehealth, is "the use of electronic information and telecommunications technologies to support long-distance clinical health care, patient and professional health-related education, public health and health administration" as well as many other modalities that support health access to health services, including clinical review, care management, wellness and prevention. *Telemedicine,* often described as the provision of clinical services from a distance, is one component of Telehealth.

California has moved forward with this vision through a successful grant award of $22.3 million from the Federal Communications Commission to build the California Telehealth Network (CTN), a high speed

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[8] *The State of Connectivity- Building Innovation Through Broadband*; CA Broadband Taskforce, Jan 2008, p.71

broadband network that will allow for the expansion of an eHealth network with an emphasis on rural and underserved populations. This network will be built beginning in 2010, connecting over 850 sites statewide. It is expected that the network will expand to over 2,000 sites through other funding opportunities such as those provided by the ARRA.

In addition to the CTN, California has another broadband network, CENIC, which provides broadband infrastructure to educational and research communities. Many of these facilities could be involved in the provision of clinical education programs for the eHealth network.

These networks are a product of California's longstanding commitment and investment in broadband and telehealth. California is a national leader in the development of technology-supported health care, having passed the California Telemedicine Act in 1996.   The California Legislature, Governor and voters have demonstrated their commitment to eHealth through the passage of bond funding, legislation and executive orders that support the continued expansion of broadband and eHealth applications.

California also has a HRSA designated Telehealth Resource Center (TRC) that provides program guides, best practices, technical assistance and other supporting services to newly developing telehealth programs funded by HRSA. The California Telemedicine and eHealth Center (CTEC) is California's TRC, one of six designated throughout the country.   CTEC has developed a comprehensive set of written program development materials, video education and training, best practice guides, policy guides, telehealth training programs and technical assistance related to telehealth.

The long term vision for eHealth in California is to:

- Provide the infrastructure to connect the full spectrum of health services in hospital, clinic, schools, homes, community centers, employer-based health sites and mobile applications, ensuring that the user's access and experience of the HIE initiatives is that of a consistent, statewide enterprise.

- Provide secure and reliable high speed modern wired, wireless and mobile broadband networks, systems, and capacity that support fully integrated, coordinated and seamless services for patient health care, public health, emergency response and economic development for California residents.

- Create a coordinated and integrated system for the delivery of eHealth Services that leverages existing services and resources, and coordinates existing efforts with new state initiatives.
- Integrate federally funded statewide projects and initiatives with efforts for expansion of broadband and development of REC / LECs (Local Extension Centers).

- Expand existing products and services of the California TRC to provide statewide telehealth support to the REC (products, templates, tools, training, technical assistance).

- Coordinate where possible the existing telehealth and eHealth initiatives for Workforce Development and Loan Funds.

California's eHealth services must enable:	Innovative telehealth services include:
• Privacy and Security of Electronic Health Information Exchange • Reliable, modern, high speed wired, wireless and mobile broadband connectivity • Innovative telehealth services • Electronic Health Record / Personal Health Record	Outpatient specialty care, behavioral health services, eICU services, telestroke programs, congestive health failure and other chronic disease/health monitoring programs in homes, senior centers, and community centers, returning solider programs, patient and provider education programs, dental services, school based health services, diabetic retinopathy screening programs, and disaster response communication grids.

There are a number of significant challenges to the successful development, deployment and sustainability of eHealth services in California. These include:

- Creation of a governance structure that is fair and acceptable to all providers and consumers.
- Coordination of existing broadband efforts to ensure appropriate level of interconnection and standardization of health information exchange.
- Meeting the needs of all stakeholders.
- Controlling and minimizing costs.
- Creation and definition of sustainable business models.
- Raising private capital to match and supplement federal government matching funds.
- Safeguarding security and privacy during expansion.

Sustainability remains elusive, even for established networks of telehealth services. While a variety of funding mechanisms may be available to support broadband and eHealth, sustainability must include a combination of fee structures, grant-type funding and when clearly in the public good, government funding.

7   Medicaid EHR Meaningful Use Incentive Program

7.1   Overview

The Department of Health Care Services (DHCS) administers publicly financed health insurance and safety net programs to almost seven million people – one in every six Californians – through Medi-Cal and other programs. DHCS invests over $38 billion in public funds to provide health services to low-income families, children and others in need. Those services are delivered through a network of provider clinics, practices, hospitals, rural health centers and other care modalities; approximately half of which are supported by a network of Medi-Cal managed care plans. Medi-Cal providers meeting specific volume thresholds and demonstrating meaningful EHR use will be eligible for Medicaid incentives funded by the Federal government under HITECH and disbursed and managed by the State Medi-Cal program.

Medi-Cal providers are primary targets for Regional Extension Center services described in this plan. Up to 85% of net allowable costs for certified EHR technology may be received to support the *purchase* and meaningful use of EHR technology. According to HITECH, for providers in clinics, practices and rural health centers, net allowable costs may not exceed $25,000 (year 1) and $10,000 for a subsequent year or:

85%* ($25,000) + 85%* ($10,000) = $29,750 up-front for net allowable costs

This may be paid to an entity promoting the adoption of certified EHR technology, "as designated by the State", if participation in such a payment arrangement is voluntary for the eligible professional involved and if such entity does not retain more than 5 percent of such payments for costs not related to certified EHR technology (and support services including maintenance and training) that is for, or is necessary for the operation of, such technology. Therefore and entity designated by the State may retain:

5% * ($29,750) = $1,487.50 per provider

This amount could be paid to a Regional Extension Center to support their activities, negotiate contracts on behalf of Medi-Cal providers and support the "feet-on-the-street" hand-on technical assistance these providers need to become meaningful EHR users. Medi-Cal can play a key role in supporting meaningful EHR use if it leverages this infrastructure.

Medi-Cal's strategic plan has three objectives relevant to this opportunity:

1. To organize care to promote improved health outcomes.
2. To measure health system performance and reward improved health outcomes.
3. To expand and promote use of health information technology.

To support meaningful EHR use among its provider members, Medi-Cal should carry out the following activities:

- Engage in a visioning and planning process to support the implementation of Federal EHR meaningful use incentive program.
- Implement the plan and work in collaboration with the regional extension centers, health information exchange governance entity and capital loan fund.
- Work with stakeholders to further define State–specific meaningful use criteria that aligns with the goals of the Medi-Cal program, its providers and the State strategic plan.

7.2   Medicaid Meaningful Use

To be eligible for incentive payments Medi-Cal provider must demonstrate meaningful use of the EHR technology through a means approved by the State and acceptable to the Secretary. In determining what "meaningful use" is, the State of California will ensure that populations with unique needs, such as children, those with disabilities and long term care needs are addressed. The State of California will also work with Medicaid providers, public health entities and others to ensure that clinical quality measures, public health indicators, and clinical summaries are supported and reported. This effort must coordinate closely with the State's health information exchange network so that these requirements are incorporated and supported by the network.

8   Privacy & Security

8.1   Overview

California is a state with a strong privacy tradition where an individual's right to privacy is explicitly stated in the State constitution. The enactment of the Health Insurance Portability and Accountability Act (HIPAA) of 1996 made the legal landscape for California's patients, providers and healthcare stakeholders more complex because of the inherent conflict between HIPAA and State law. The federal initiatives in 2004 to stimulate electronic health information exchange among healthcare stakeholders while ensuring the protection of an individual's privacy highlighted this complexity. California's participation in the federally-sponsored Health Information Security and Privacy Collaborative (HISPC) project validated that a wide variation of privacy and security practices had evolved among hospitals, clinics, and plans.

Building a sustainable health information exchange infrastructure in California that enables sufficient health information liquidity to allow clinicians to improve efficacy of care will require a new harmonized privacy and security framework. This framework creates consumer and provider trust that health information will be appropriately safeguarded and used only for authorized purposes. The California Privacy and Security Advisory Board (CalPSAB), a public-private collaborative of health care industry stakeholders, develops privacy and security policy recommendations for the CHHS. The resulting policies create a foundation for sustainable health information exchange infrastructure in California that supports meaningful use of the data.

The CalPSAB oversees a large collaborative and transparent process composed of consumers, privacy advocates and representatives from all aspects of the health care industry including hospitals, clinics, physician groups, consumers, health plans, health information organizations, and others. The Board is charged with recommending solutions to the Secretary of the CHHS on health information exchange privacy and security issues. The CalPSAB structure consists of a board of representatives from government and private healthcare stakeholders appointed by the Secretary. The board has five standing committees; Privacy, Security, Legal, Education and Health Information Organizations (HIOs) with open participation. As of August 1, 2009, over 450 representatives participate in the CalPSAB process.

The vision of the CalPSAB process is to allow the impacted health care stakeholders an opportunity to deliberate and recommend to the Health and Human Service Agency the actions and elements necessary to build a new privacy and security framework. The framework will enable the electronic transfer of individual health information to improve the quality of care in a way that fosters trust. The recommendations may include guidelines, suggested legislative actions, data element transmission standards and recommended policies that will enable the exchange of necessary information for improving the quality of care while assuring consumers that healthcare entities are appropriately using, disclosing, and protecting their information.

The Privacy and Security guidelines will apply to entities in California that participate in state HIE efforts. The initial guidelines are intended to provide entities with a common set of protocols which will enable the safe and secure exchange of individual health information during the implementation phase of

electronic health information exchange while supporting meaningful use of the data. These guidelines will evolve as federal and State law and regulations change and funded entities identify needed amendments. After collaborative analysis and deliberation, the requirements will apply to all health data transmitted electronically through health information exchange.

The following operational principles have been developed by the CalPSAB process and approved by the Secretary of CHHS. They provide the foundation for development of the California privacy and security framework. The principles will promote that policy recommendations made through this process will achieve the balance between protecting individuals' privacy and allowing critical health information to flow to providers in a timely manner to improve the quality of care provided.

Openness

There shall be a general policy of openness among entities that participate in electronic health information exchange about developments, practices, and policies with respect to individual health information.

Individual Health Information Quality

Health information shall be relevant, accurate, complete, and kept up-to-date.

Individual Participation

Individuals have the right to:

• Ascertain the person responsible for individual health information for an entity, obtain confirmation of whether the entity has specific individual health information relating to the individual, and obtain its location.

• Receive their individual health information in a reasonable time and manner, at a reasonable charge, and in a format that is generally accessible by individuals.

• Challenge the accuracy of their individual health information and, if successful, to have the individual health information corrected, completed, or amended.

• Control the access, use, or disclosure of their individual health information, unless otherwise specified by law or regulation.

Collection Limitation

There shall be limits to the collection of individual health information. Individual health information shall be obtained by lawful and fair means. Where appropriate, it shall be obtained with the knowledge or consent of the individual. The specific purposes for which individual health information is collected shall be specified not later than at the time of collection.

Individual Health Information Limitation

Use and disclosure of individual health information shall be limited to the specified purpose. Certain use and disclosure shall require consent.

Purpose Limitation

Individual health information shall be relevant to the purpose for which it is to be used and, limited to the minimum information necessary for the specified purpose. The subsequent use shall be limited to the specified purpose.

De-Identified Information	De-identified individual health information shall not be re-identified unless specified in law. If de-identified individual health information is re-identified, it shall be subject to these principles. De-identified individual health information shall not be disclosed if there is a reasonable basis to believe that the information can be used to identify an individual.
Security Safeguards	Individual health information shall be protected by appropriate security safeguards against such risks as loss or destruction, unauthorized access, use, modification or disclosure of data.
Accountability	An entity shall comply with laws, regulations, standards and organizational policies for the protection, retention and destruction of individual health information. Any person who has access to individual health information shall comply with those provisions.

8.2   Initial Priority Targets

The initial priority target of forming the CalPSAB collaborative structure and reaching consensus on vision, mission, scope and principles, identifying the relevance of HIPAA as a baseline and analyzing consent in specific scenarios has been completed. The CalPSAB through CalOHII has completed an initial set of Privacy and Security Guidelines to enable the safe and secure exchange of individual health information. The initial guidelines are intended to enable the safe and secure exchange of data consistent with the Medicaid "meaningful use" requirements. The initial focus of the policy development will be:

- Treatment
  - o Clinical Treatment
  - o Care management to improve the quality of health care services by:
    - – Assisting a patient in obtaining appropriate medical care,
    - – Supporting a patient in following a plan of medical care, and
    - – Coordinating the provision of multiple health care services.
- Limited Public Health/Research

Working with a comprehensive core data set that will enable care providers to coordinate patient healthcare, CalPSAB will develop privacy and security policies and standards that ensure needed information is made available to healthcare providers. Appropriate privacy and security protocols will be created that will ensure entities do not engage in practices that result in overly broad uses and disclosures of health information. Policies will leverage administrative and technical solutions, such as interfaces that can segregate information based on purpose and need. Knowledge gained from the experiences of current electronic health record systems and early health information organization implementers will help identify and define changes to the guidelines necessary to develop more effective policies. Over time, it is envisioned that privacy and security policies and standards will replace the guidelines.

8.3   Challenges

Two privacy issues present the greatest challenge of reaching agreement among the diverse stakeholders; 1) what uses and disclosures should be allowed to occur through an electronic health information exchange, and 2) should patients have the right to consent to having their individual health information exchanged electronically between entities and for what purposes. Developing scalability of privacy and security policies that can be applied to entities as small as single-provider practices, primary care clinics, and large hospital systems is a complex task because of the impact of the requirements.

Sustainability

The CalPSAB activities have been initially supported through a combination of HISPC funds, which are no longer available, and support from CalOHII. The collaborative process to finalize the framework through 2015 will require additional resources to support this critical effort.

Relevant Legislation

California has an abundance of privacy law in various codes and case law which may support or hinder the safeguarding of privacy and security of personal health information and the flow of information electronically. The strategic coordination of the Guidelines effort with existing and future State statutes is vital to the success of Health IT & HIE in California. The following graphic depicts such coordination efforts.

Coordination Efforts
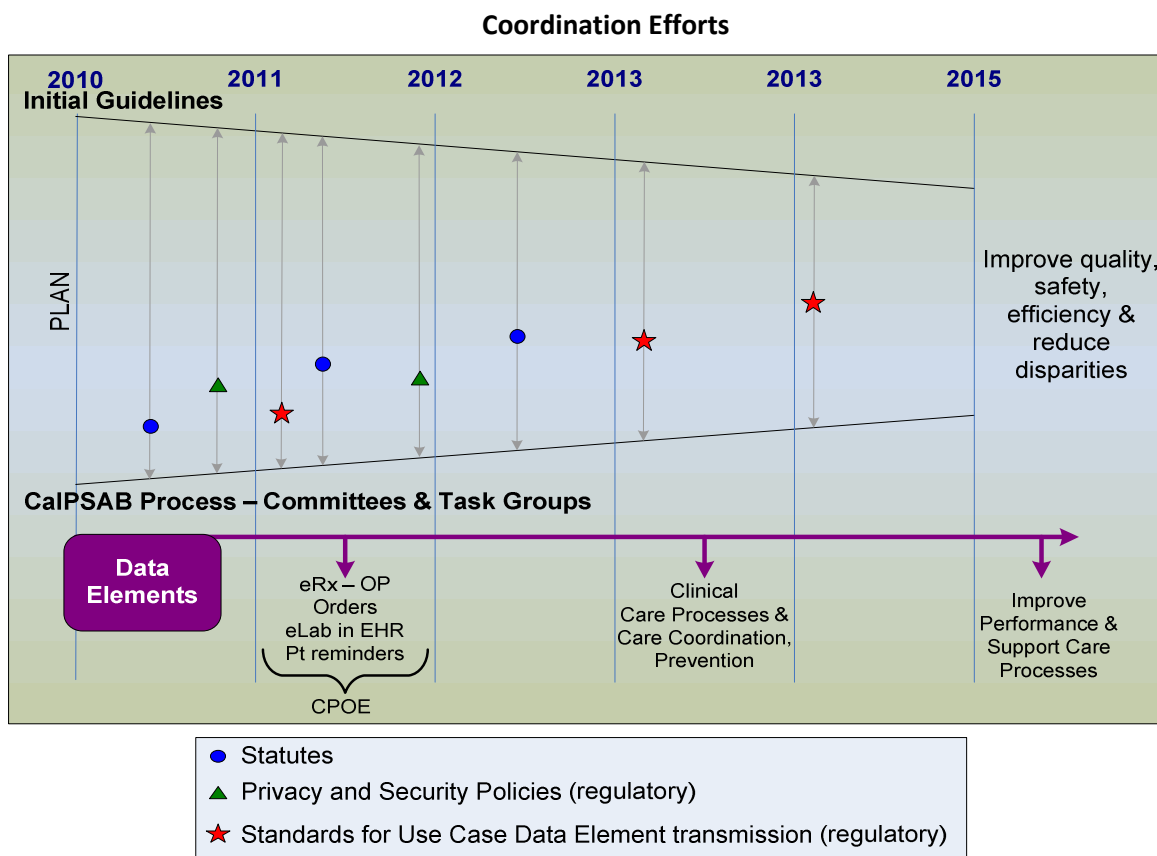
8.4   Next Steps

California will continue to work to harmonize between the privacy and security laws and regulations to promote the exchange of individual health information within and outside of California. The CalPSAB process will be utilized to continually develop the privacy and security policies incorporating: 1) the lessons learned by the entities and consumers affected by the guidelines, and 2) the analysis and development of the issues as influenced by federal law and regulation changes, and State laws, including the State Constitutional law governing privacy. As part of this policy development, California will utilize the standards of the various national workgroups and federal care delivery organizations to minimize variations in policies between the national perspective and California perspective. We expect that these policies will become guiding statutes and regulations for all health care stakeholders involved in the electronic exchange of health information.

9   Public Health

9.1   Overview

The California Department of Public Health has a vision for a healthier California and plans to work closely with Regional Extension Centers and Local Extension Centers, loan funds, workforce and telehealth broadband efforts to implement the statewide plan. Through the use of health information technology, public health informatics can help achieve this goal by monitoring health outcomes, increasing outreach for prevention services, and identifying targeted interventions in the future. Through the Health Information Technology for Economic and Clinical Health (HITECH) Act, the Office of the National Coordinator for Health IT (ONC) has proposed to establish and encourage meaningful health criteria, including key public health measures. In compiling this strategic plan, stakeholders across the State have contributed to defining what should be part of the future vision of public health informatics to lead California providers to successful uses of Health IT.

Public health is an essential part of the health care system in California and serves many functions that vary in synergistic ways from the local to the state to the federal levels. Local health departments (LHDs) serve as the lead in identifying, investigating, evaluating, and treating new cases of reportable and unusual disease, including assessing and containing outbreaks. LHDs are also the first line in epidemiologic surveillance of the diseases and conditions affecting the health of their communities, and work with partners to identify and implement programs and services to address health issues identified from surveillance efforts. Finally, LHDs work with individual patients to assist them in receiving services within the community and from State and federal agencies.

Public Health stakeholders across the State collaborated to compile information and develop recommendations describing the essential function of public health initiatives designed to improve population health. HITECH includes minimum specifications for meaningful use criteria. Ultimately the goal of "meaningful use" is to improve health outcomes and status, add value and reduce costs through the use of robust EHR systems. By ensuring that meaningful use criteria also aligns with public health goals, HITECH implementation will benefit providers, public health and the health of the community.

9.2 Description of Public Health

Future efforts within public health will occur within the five key public health centers in California.   In addition, overarching efforts within Health Information and Strategic Planning (HISP) and the Emergency Preparedness Office intersects with the efforts within all five centers. Each center will have responsibility for data collection and health information exchange, including:
- Center for Chronic Disease Prevention & Health Promotion
- Center for Environmental Health
- Center for Family Health
- Center for Health Care Quality
- Center for Infectious Diseases

These centers ensure quality leadership and management oversight of core public health domains; ensure high-level visibility of these important public health programmatic domains to key partners and stakeholders such as local health departments, health care providers, the federal government, the Legislature, advocates, the press, and the public; and bring greater domain-specific expertise to the executive management team via the center deputy directors.

There are limited numbers of professionals with adequate training and expertise to assist providers in successful and transformative implementations of Health IT. In order to meet this challenge, the Regional Extension Center (REC) will collaborate with various partners, including public health, to support the delivery of training, programs, and services for the necessary on-the-ground workforce.

Data Collection
Electronic health information has the potential to transform the way public health and local health departments perform their duties. At the state level, the California Department of Public Health (CDPH) leads the efforts to create policies and services that improve the health of Californians through activities such as statewide monitoring of the health status of the population, diagnosing and investigating health problems and health hazards in communities, and informing, educating and empowering people about health issues. As data to support these activities are gathered at the local and State levels, significant resources are invested to obtain the information through hand-written documents, faxes, and manual data entry into electronic systems, often resulting in time lags and repeated requests when obtaining needed data. Timeliness of data is essential for public health to respond to new and emerging threats and is often absent due to the current paper-based environments.

Health Information Exchange
The difficulty of establishing robust health information exchanges (HIE) remains a significant challenge. For public health, the full benefit of Health IT is the interoperability and exchange of data at the community level. CDPH must be able to transmit and integrate data across multiple internal and external data sources and transform these data into meaningful information in order to prepare for and respond to emergencies, diseases, outbreaks, epidemics, and emerging threats. There remains a need for comprehensive and integrated communications tools supported by IT infrastructure to work collaboratively and in real time among CDPH program areas.   External partners and the public could effectively share and disseminate information necessary to achieve timely public health interventions and response.

Need for Standards
CDPH must have the ability to guarantee secure, reliable, and rapid information access and communication capabilities essential to respond rapidly to public health emergencies within the evolving public health environment. This may require both identifiable and de-identified data that can be linked, integrated and used for public health prevention and quality of care improvements. This will allow full use of geographic software to provide useful data for communities that can be understood by providers and the public.

California statute requires reporting of many diseases and conditions to the California Department of Public Health, which places a significant burden on providers and hospital systems, as this reporting is currently performed through manual processes that do not yet leverage the potential that can be achieved with electronic HIE. Many of these items are beginning to be captured in the Continuity of Care Document (CCD), which is a patient healthcare summary standard. Although the CCD does not encompass all current statutory reporting requirements, it does include current medical problems, procedures, family history, social history, payers, advance directives, alerts (allergies, adverse reactions), medications, immunizations, medical equipment, vital signs, functional status, results, encounters, and plan of care. Thus the CCD serves as a solid basis that, if implemented within California HIE, would likely relieve significant work load requirements currently experienced by both providers and local and state public health departments. Public health must identify its priorities that will benefit Californians as HIE is implemented across the state. The CDPH Data Policy Advisory Committee recommends a focus on the infrastructure necessary for CDPH and local health departments to be a part of a collective HIE.

A Key Priority: Plan for California's Immunization Registry
As an example of one of the key targeted areas for Health IT priorities, we describe a plan for California's immunization registry. Similar efforts will be in place to achieve effective meaningful use through lab exchange, e-prescribing, continuity of care records and tuberculosis registries.

At the present time, the State of California's statewide immunization registry consists of nine regional and one county registry. The state has a permissive registry model where participation is encouraged, but not required. Providers in public sector clinics are required to participate, but private providers are not and have a significantly lower use rate. One of the largest providers, Kaiser Permanente, does not participate in the statewide registry system and remains an ongoing challenge. There are four software systems currently utilized in the statewide registry system: CAIR, utilized by 7 of the 9 regional registries, and separate systems in the mid-San Joaquin Valley, the San Diego region, and Imperial County. The registries are sharing data electronically with many provider groups throughout the state. As in the rest of the United States, the majority of electronic immunization data exchanges utilize flat files. Real time bidirectional HL7 data exchange is occurring on a limited basis between a few provider organizations and the San Diego registry. The immunization registries offer a variety of functions, such as providing California school forms and inventory features, which currently are not included in electronic health record systems.

We envision a statewide immunization registry that supports bi-directional interfaces in real-time, near-time, and batch delivery modes for healthcare providers caring for adults and children. The regional immunization registries must also support data exchange across all regions. Improved registry functionality will allow providers to enter information as well as retrieve up-to-date immunization records in their native electronic health record, disease registries or the immunization registry.

To prepare for maximum leverage of Medicare/Medicaid stimulus funds, the State of California will lead an effort to publish detailed specifications and a process to support the statewide registry. The HITECH strategic planning efforts allow for an integrated plan that promotes workforce training to provide on-the-ground registry support at the local and regional levels. In addition, through committing to Medicaid program implementation, we will work with stakeholders to include meaningful use criteria that create incentives for immunization registry participation. Support for new EHR software purchases must also support bi-directional interfaces and batch exchanges for use with the statewide registry to qualify for HITECH funds. California's Regional Extension Center will support this effort by providing template contracts and requirements for EHR purchases, project plans and technical assistance to ensure that bi-directional interfaces and batch exchanges with immunization registries are utilized.

Through the use of health information technology, public health informatics can help achieve its overall goals by monitoring health outcomes, increasing outreach for prevention services, and identifying targeted interventions in the future for each program within public health.

10 Additional Building Blocks

The nine interlocking building blocks described in this plan are fundamental components of a sustainable, transformed health care delivery system. But they are not sufficient, nor are they exhaustive; additional components are needed to bolster health system transformation and will be incorporated into subsequent updates to this plan. These components include:

- **Administrative Efficiency**: health care institutions must support widespread automation of program enrollment, electronic eligibility and benefit lookup and determination, claims transactions and other administrative functions.
- **Mental Health**: the segmentation of mental from physical health services delivery results in discontinuity and sub-optimal care for people who suffer from mental health, substance abuse and addiction ailments. Mental health Information systems must interoperate with physical health EHRs and workflow processes re-engineered so that care can be effectively coordinated across delivery systems.
- **Prisons**: The prison health system has a separate Health IT infrastructure that must interoperate with the civilian health care delivery system to ensure continuity of care of the prison population as they transition back into the civilian workforce.
- **Long-term Care**: The special needs of nursing homes, assisted living facilities and Residential Care Facilities for the Elderly (RCFEs) must be addressed to ensure continuity of care between these institutions and other health care institutions including hospitals and providers.

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Consultants and Staff
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Thank you

Appendix A – Health Information Exchange Advisory Board

CO-CHAIRS

Kim Belshé, Secretary, California Health and Human Services Agency

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MEMBERS

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Karen Bass, Speaker of the Assembly

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Sam Karp, Vice President of Programs, California HealthCare Foundation

David Lansky, PhD, President and CEO, Pacific Business Group on Health

Ken McEldowney, Executive Director, Consumer Action

Lynn Rolston, Chief Executive Officer, California Pharmacists Association

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Ben Wilson, Director of Healthcare IT, Intel Digital Health Group